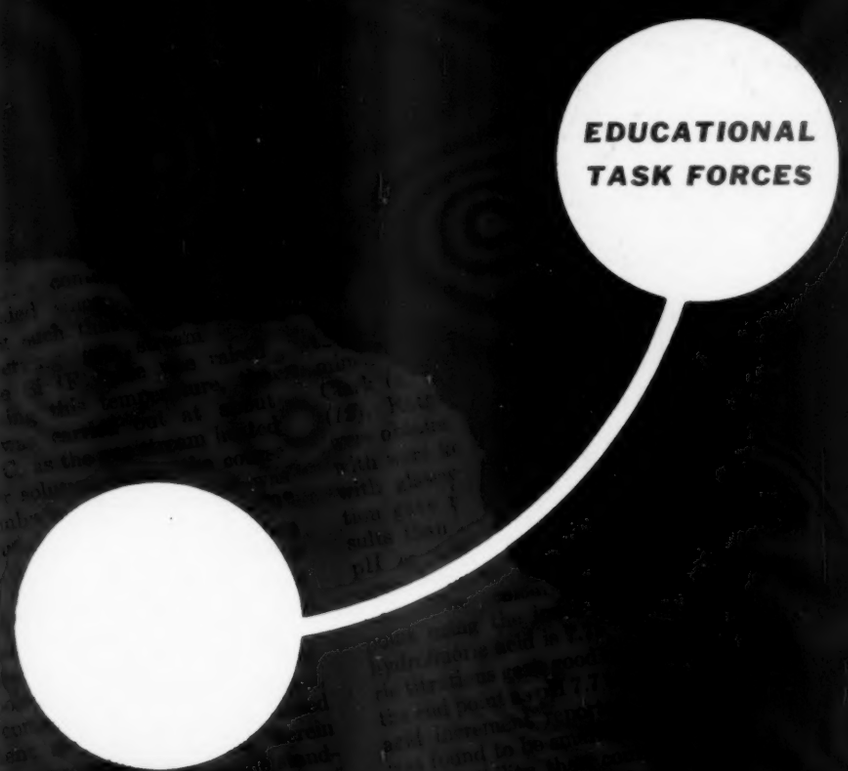
APRIL • 1958

AUDIOVISUAL INSTRUCTION

Published by the department of audiovisual instruction, NEA



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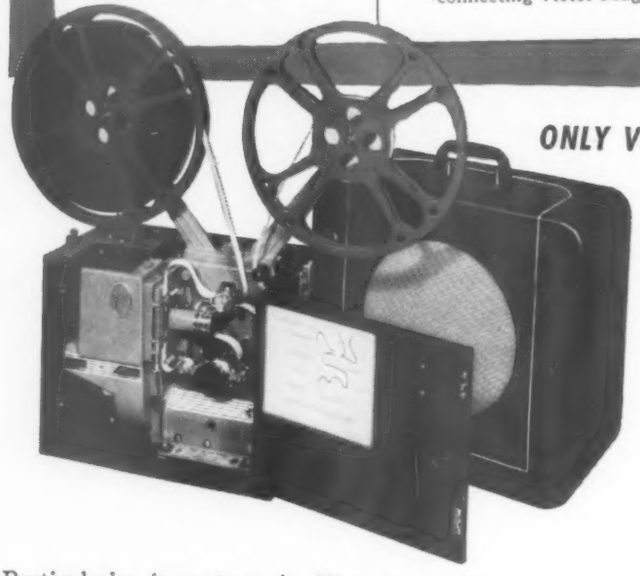

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AUDIO - VISUAL INSTRUCTION is published monthly except July, August, and September by the Department of Audio-Visual Instruction of the National Education Association of the United States, 1201 - 16th Street, N. W., Washington 6, D. C. AUDIO-VISUAL INSTRUCTION goes to all members of the Department; membership dues including AUDIO-VISUAL INSTRUCTION, $5; including *Audio-Visual Communication Review* in addition to AUDIO-VISUAL INSTRUCTION, $8. Single copies of AUDIO-VISUAL INSTRUCTION, 50 cents, annual subscription, $4. Second class mail privileges authorized at Washington, D. C. Copyright 1958, Department of Audio-Visual Instruction, NEA.

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the EDITOR'S notebook

ALL HATS should be off to Edgar Lane for his work in preparing the AV evaluative criteria to be submitted to the general committee of the Cooperative Study of Secondary-School Standards. As many of you know, the 1960 revision of the Evaluative Criteria is now being prepared, and as in the past will form the basis of criteria used by most regional accrediting agencies. Edgar has been supported by a committee consisting of Walter Bell, A. W. VanderMeer, Joseph Murphy, Robert LeAnderson, Ruth Noel, Altha Sullivan, William Price, and Harold Coman.

As Walter Bell put it so well in a recent letter to Edgar: "A wonderful job has been done in revising our original effort and the revisions show that many hours of work and study have gone into this project. Maybe now you can get some rest, regain your health, and go back to work for your school system. In any case all of us AV people owe you a great deal. . . ."

The Committee for Revision of the Cooperative Study will meet in Philadelphia for six weeks this summer to prepare the final document for 1960. Dr. VanderMeer has accepted an invitation to work with the Committee for the week of June 8. Having been close to Edgar on the evaluative criteria project, he will be in a good position to present our proposals.

• • •

How many of you have seen the exciting new film, *Uncle Sam Goes to the Fair*, narrated by John Daly of ABC. Scenes from exhibits in Tokyo, Casablanca, Milan, Paris and Poznan, Poland, show how the United States has promoted international good will and increased trade through participation in international trade fairs. Prints can be borrowed from the Office of International Trade Fairs, U. S. Department of Commerce, or through their regional offices. The film is available in color.

• • •

Did you know that Bill Allen, *AVCR* editor, has entered the filmstrip production field? His first three productions, *Effectiveness of Audio-Visual Materials*, *How To Use a Teaching Film*, and *Teaching by Television* are now available from Basic Skill Films, 1355 Inverness Drive, Pasadena 3, Calif.

• • •

Those of you who are interested in an international selection of filmstrips and 35mm films will want to see the catalog from the International Visual Aids Center at Brussels. In the interests of better international understanding, the Center has gathered materials throughout the world and has compiled them under the direction of specialists in geography, history, science, art and religious subjects. About a year ago we previewed some of the filmstrips in the national office and were much impressed with their quality. For listings write the Center at 37-39 rue de Linthout, Brussels 4, Belgium.

• • •

"Ten Criticisms of Public Education," is the title of the December 1957 issue of the *NEA Research Bulletin*, selling for 80 cents. The purpose of the study is to assist in a clearer evaluation of the current criticism of education. To this end research information pertinent to 10 selected areas of criticism is presented: control of public-school policy, progressive education, life adjustment education, promotion and reporting practices, discipline, instruction in classical and modern foreign languages, science and mathematics in high schools, education of gifted children, moral and spiritual values, and teacher education.

• • •

The NEA Press and Radio Division informs us that they are scouring the country for human interest stories, news items, and statistical data pertaining to schools. These will be cataloged to provide a central source of educational information for commentators and magazine and newspaper writers. We are told that requests come in almost daily from writers seeking background materials on some phase of education—new teaching aids, unusual accomplishments of students, curriculum, school buildings, and almost any other facet you can think of. It occurs to us that this is one more opportunity to broadcast information about audio-visual education

• • •

The NEA has appointed an observer to the United Nations, a move that has been in the offing for several years but only now made possible as another benefit of the Ex-

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panded Program. We're happy to report that Richard I Miller, the "NEA's eyes and ears in the UN," as he has been called, has indicated a strong interest in AV.

During a recent visit to the DAVI office he offered to help locate articles from abroad and get them translated. He is also interested in improving the picture of AV in the United States as presented in UNESCO and other international publications, and hopes to facilitate DAVI participation in foreign organizations, particularly those sponsored by the UN or its agencies.

Dr. Miller comes uniquely qualified for his job, we think, having had both teaching and broad international experience. An undergraduate at the University of Nebraska, he got his Ed.D. from Columbia Teachers College and later taught at the University High School, University of Illinois, at the American Community School at Beirut, Lebanon, and at Penn State. He has had wide experience with the UN and its specialized agencies, travelling in 35 countries and recently completing a study of the educational development of the three trust territories. In his new job he will work closely with the UN agencies and other non-governmental organizations, preparing materials on the educational aspects of their work for teachers. In our opinion, this international link can be of especial significance to the audio-visual field.—A. L. H.

Coming in May

Last spring (April issue) AVI established the audio-visual coordinator as the "vital focus where AV is applied to the classroom." This year we take a second look at the coordinator role. As the curriculum changes to meet new needs in education, as materials are added, new devices introduced, and traditional teaching ways altered, the role of the AV coordinator will accordingly take on new aspects. Some trends are already apparent in audio-visual programs as they function effectively in various sections of the country. Ready to report on them in May are Carolyn Guss, Indiana; A. Kingsley Trenholme, Oregon; Audrey Newman, Florida, and Opal Rosson, Texas.

PICTURED ABOVE is the planning committee for the 15th Annual International Conference on Audio-Visual Christian Education to be held this year at the Pennsylvania State University, University Park (State College), August 19-23 and the First National Executive Consultation on AV Christian Education to precede it August 15-19. For details write T. Reed Ferguson, Extension Conference Center, Pennsylvania State University, University Park. Shown left to right: Rev. Vern Rossman, Division of Foreign Missions, National Council of Churches; Rev. Donald Bauter, Cathedral Films; Gerald Torkelson, professor of education, Penn State; T. Reed Ferguson; Rev. Alva I. Cox, Jr. and Bob Cosner, Department of AV and Broadcast Education, NCC; Rev. Thomas Inabinett, Disciples of Christ United Christian Missionary Society; Rev. Don Kliphardt, NCC (AV department); Margaret Barnhart, Methodist Editorial Division; Daniel Kraft, Hartford Seminary Foundation; Rev. Earl Waldrup, Southern Baptist Sunday School Board; Rev. John Harrell, Protestant Episcopal AV Division; Rev. S. Franklin Mack, NCC Broadcasting and Films Commission.

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Art spot page 118, Coronet Films Catalogue, 1958-59
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in this issue

AVI reports on some of the task forces that are "turning the curriculum inside out" in search of new ways to perfect the American system of education. Introducing this series of articles, Mr. Caldwell views the required pattern of change as one based on "overriding national needs."

SCIENCE
/108

ABOVE Elbert P. Little, director of the Physical Science Study Committee, demonstrates the ripple tank, example of low cost materials with which the Committee plans a thorough revision of the physics course. Stephen White, editorial consultant to the Committee and former science writer for the New York *Herald Tribune*, describes the role of films in this new program that will enable students to explore the same kinds of problems that attract leading physicists.

"NUMBERS are as abstract as angels . . . Mathematics is as creative as music . . ." Behind this kind of talk is a group of experimentalists at the University of Illinois — out to prove that the mathematics course should be geared to "what adolescents feel and think, not to the reactions ascribed to them by grownups." Helen Rowan, editor of the *Carnegie Corporation of New York Quarterly*, gives an account of this experiment spearheaded by Professor Max Beberman.

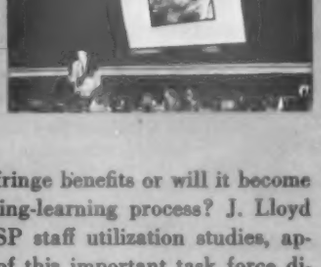
MATHEMATICS
/112

LEGISLATION
/114

THE CRUCIAL OBJECTIVE in education today is getting the right kind of federal legislation; the size of the task force is limited only by public interest. Here to report on both Administration and NEA-sponsored bills is Harrison Sasscer, assistant director of the NEA Division of Legislation and Federal Relations. Mr. Sasscer is thoroughly familiar with AV implications, having worked closely with the DAVI Legislation Committee.

TELEVISION TEACHING
/106

JOHN J. SCANLON, deputy director of research for The Fund for the Advancement of Education, tots up the score at midpoint in the Fund's nationwide experiment in TV for teaching large classes. An observer at the DAVI-sponsored ETV seminar last fall, Mr. Scanlon will be on the DAVI Convention program in Minneapolis later this month.



STAFF UTILIZATION
/103

IS THE ROLE of AV to supply fringe benefits or will it become an integral part of the teaching-learning process? J. Lloyd Trump, director of the NASSP staff utilization studies, applies his experience as head of this important task force directly to the audio-visual field. His answer, in the form of his own theory of instruction, is based also on 30 years' experience as teacher, principal, and college professor in Illinois. See also book review by Edward Schofield, page 105.

GIFTED CHILD
/110

WHEN A TASK FORCE of 200 educators met in Washington to consider an improved curriculum for gifted students, Zachariah Subarsky, biology teacher, Bronx High School of Science, Alexander Frazier, assistant superintendent, Phoenix public schools, Murray L. Miller, AV director, Illinois State Normal University, and Mildred Cobb, AV coordinator, Waggener High School, Louisville, formed a special committee on AV implications. Their report begins on page 110.

education for SURVIVAL

needed curriculum changes as I see them

by oliver j. caldwell

AMERICAN EDUCATION is based on the assumption that all men and women have an equal right to learning. Below a certain level it is universal and free; above that level it is the responsibility of the individual and his family to buy educational opportunities, although many sources of help are accessible to gifted students.

With minor exceptions the Federal Government does not contribute to the support of state and local education, and with no exceptions, exercises no control over it. The American curriculum was developed to help the individual identify and achieve his personal aspirations, and beyond that, to meet the needs of local communities, and sometimes of states.

There is no evidence that our early educational planners foresaw the rise of overriding national educational needs in this country. That these national needs do exist is without doubt the main factor in any consideration of curriculum revision.

The American curriculum must be revised to equip Americans for survival in an age where man has found new ways to exploit the powers of nature that can be either terrifying or beneficial, in an age where the interdependence of nations forces man into new relationships with his fellows. American education is bound up with the struggle between the Western world and Communist countries, which, even as the cold war abates, will continue in the form of intense competition in the conquest of space, in scientific, cultural, and economic pursuits, and in spreading the fruits of these achievements among other nations.

Global living and the rigorous international competition that goes with it is not a new fact of life, but its relation to the school curriculum was impressed upon the American consciousness last October when the Russian Sputnik told the world of the tremendous strides within the Soviet educational system.

SOVIET EDUCATION is a vigorous hybrid. It is not yet universal in the sense that every child in the USSR goes to school or continues as far as he might wish. However, the goal of Soviet education appears akin to the American idea of universality. The abilities of each child are regarded as a national asset which must be developed. The impressive increase in the quantity of Soviet education and the improvement of its quality during the past 20 years is evidence of the nature of its goals. Thus elementary-secondary enrollment in the USSR increased from 11,500,000 in 1927-28 to 28,200,000 in 1955-56. In higher education it climbed from 169,000 to 1,867,000 in the same period. (See *Education in the USSR*, U. S. Office of Education.)

Additional evidence concerning the nature of Communist educational policy is the phenomenal growth of education in Communist China. According to R. F. Simpson of the University of Hong Kong writing in the *Phi Delta Kappan* (December 1957), enrollment in elementary, middle, and secondary schools increased in Mainland China from 25,776,00 in 1949-50 to more than 78,857,000 in 1956-57, and in higher education from 117,000 to 443,000 in the same period.

Even if education were strictly an internal matter these figures would be of interest to Americans. There are indications however that the Soviet Union is making its educational institutions available to foreign students. If education is to become part of the growing competition in the export of ideas, the United States can afford to do no less. It must provide opportunities for foreigners to be educated here and be prepared to meet requests for overseas education-

Born of missionary parents, the author has a background of educational work in China. He is assistant commissioner for international education, U. S. Office of Education.

al assistance. While this need is felt most strongly at the national level, it will require cooperation at state and local levels.

A century and a half ago when our educational foundations were laid America was part of a regional culture; now it has become part of a rapidly evolving world-wide complex of cultures. This requires knowledge of Japan, Burma, and other countries once thought of as out-of-the-way places. This in turn entails a major reorientation of the curriculum at all levels with new textbooks and better-trained teachers. Since we must cooperate with others throughout the world, we must learn to talk to larger segments of the human family. We must intensify and broaden the teaching of languages.

THE ADVANCES of science and political and military developments sometimes create sudden new needs. Under the prevailing power structure in American education it is difficult to initiate action to meet such needs, as for instance, the language need. What schools are teaching Arabic, Russian, Hindi, and Chinese?

Should not the vocational aspect of education be fluid, and adjust itself readily to changing human needs?

The curriculum must be responsive to national needs in the current struggle for survival, but there is also a danger of going to extremes. We must maintain a balanced educational system based on human needs as well as on the needs of the nation. Because we are in competition with Communist education there will be a temptation to meet this competition either by emulating the Soviet emphasis on mathematics and natural sciences, or reverting to our Western European ancestry and concentrating on superior education for a few. Either course could lead to disaster.

Our pre-eminent educational needs, then, are national in scope and can be summarized something like this:

1. *The need for truly universal education of high quality.* Since both wars and frontiers are won or lost by whole populations, it is imperative that education be truly universal and of high standard.

2. *The need to identify and train talent.* The loss of a potential Einstein could be a national disaster.

3. *The need to provide international educational leadership.*

4. *The need for communication skills (teaching more languages).*

5. *The need for strategic flexibility so that sudden educational needs can be met more efficiently.*

6. *The necessity to maintain a system of education based on human needs as well as on the needs of the nation.* We must remain true to ourselves, building on the educational foundation we posses a new stronger system of truly universal education which will equip men and women to cooperate with friends who recently were strangers.

There are three ways to build a new curriculum on existing foundations: by adding new courses, by adding new materials to existing courses, and by substituting new subject matter for old. All three probably will be employed in the period ahead.

At every level we must be alert to appraise that which is now being taught in terms of present and foreseeable needs. For example, astronomy has become the geography of the future. Schools in such countries as Turkey, Japan, and the Soviet Union reflect an awareness of this new significance of an old science by giving it a prominent role in the curriculum.

Much can be added to present courses: social science courses can be broadened to include a greater bulk of materials relating to non-European cultures. World literature courses can include translations of Afro-Asian classics. Supplementary readers can be used in the elementary grades to introduce the majority of mankind to American children.

THE PRINCIPAL METHOD of broadening the curriculum however must involve the addition of new subject matter. As life becomes more complex and the volume of useful knowledge grows, each individual must know more than people of earlier generations. Thus logic leads us to conclude that these must be minimum standards of American education:

- At least 12 years of compulsory schooling.
- A recommended minimum of 14 years of free and compulsory education.
- Four years of free university education to all qualified students.
- Free professional training for graduates of the liberal arts college passing competitive tests (those who fall below competitive standards to be admitted on a tuition basis).

What new knowledge must students receive? Granted that the answer to this question will never remain the same and that no one centralized source is wise enough to tell schools in the 48 states what they should teach, it appears from the viewpoint of national needs that these general changes should be made:

1. In the first nine years children should be introduced to the geography of the world and the history of mankind. They should read in translation select passages from the great literature of the world, learn the ethical ideas common to most humanity, and start to learn a foreign language.

2. The secondary school must build on this foundation, offering mathematics and science at standards equal to those anywhere in the world, language instruction expanded in quality and quantity and including in addition to standard European languages one of the great "exotic" languages—Russian, Chinese, Hindi, Arabic. Advanced geography, introductions to anthropology and astronomy, world history, and world economics should also be part of the secondary curriculum.

3. College students should study the contributions of the chief branches of the human family in at least four great areas of knowledge: humanities, social sciences, natural sciences, and ethics and religion. In the future every educated person should know, share, and enjoy the accumulated fruits of all the great cultures. This is the minimum essential to human survival, since this knowledge of others is required for mutual understanding.

Mankind today stands on the threshold of a new world. Time inexorably forces ahead towards the unknown. All we can know is that we face immense new problems, and that through improved education for everybody we may have a chance to master these problems and to create an age of gold.

av

in a new teaching structure

by j. lloyd trump

ENRICHMENT, entertainment, and and ebullience—fringe benefits. Are these the roles of audio-visual aids, or will AV actually become an everyday, integral part of the teaching-learning process? The answer to that question will continue to be mainly negative unless fundamental changes are made in secondary schools in redeploying staff, students, content, space, and money.

The only inventions in history that have found their way into everyday instruction and that have won true acceptance by the profession are writing, invented by primitive men, and moveable type, discovered by Gutenberg in 1454 and by the Chinese considerably before that. Schools still teach mainly by the spoken word of the teacher and by books and other printed materials.

Recent and current experimental approaches to improved staff utilization sponsored by the National Association of Secondary-School Principals' Commission on the Experimental Study of the Utilization of the Staff in the Secondary School suggest changes that may lead to the use of audio-visual materials in ways heretofore mainly dreamed about by specialists in the field. Descriptions of these studies, along with other information relative to staff utilization, are given in detail in the January 1958 issue of *The Bulletin*, published monthly by the National Association of Secondary-School Principals. (See review on page 105.)

In order to stimulate further thinking concerning the possible use of audio-visual materials, the writer presents a theory of instruction as a frame of reference. This theory, aimed ultimately to improve the quality of education, grows out of a combination of study of other theories, observation of the early results of the staff utilization studies referred to in the preceding paragraph, and three decades of experience as a student of teacher education and as teacher and administrator in secondary schools.

A Theory of Instruction

Three general phases of the teaching learning process can be recognized even though adaptations are made in relation to different subject areas, characteristics of youth in different schools, and differences in ability and interest among teachers. These three phases may be called *Presentation-Assimilation, Study,* and *Discussion.*

The Presentation - Assimilation phase will include a number of teacher-pupil activities carried on in a setting of large-group instruction where as many as 100 or more students are assembled for presentation and discussion by teachers who are particularly competent, who have more adequate time to prepare for what they need to do, and who utilize the latest material aids to instruction. At least eight major types of teacher-pupil activities may be identified as parts of this phase:

1. Introduction: new topics, units, and concepts are ushered in and placed in relation to other learnings; purposes are presented; readiness for learning is developed.

2. Motivation: reasons for study are understood; interest is stimulated; students are assisted in self-analysis of present knowledge.

3. Explanation: understanding of terms and concepts is further developed; ideas are elucidated; questions posed and answered.

4. Exploration: identification of the range of possible learning activities is provided and developed; interests are amplified.

5. Planning: constructs are developed; decisions are made regarding what learning activities are contemplated; methods of study are planned; next steps delineated.

6. Report and digest: what has been learned is shared; techniques for absorbing learnings are developed; drill, memorization, and organization devices are practiced.

7. Generalization: understandings and appreciations are developed; concepts that can be transferred to other situations are realized.

8. Evaluation: possession of knowledge, appreciations, and generalizations as well as other outcomes are measured prior to study, during study, and at the conclusion of a period of activity or time; a variety of evaluative techniques are developed and utilized.

The foregoing activities may occupy as much as 40 percent of the students' time. Obviously, the activities may occur at different times in the learning process; the need for any one of them at a given time will be developed jointly by teachers and students on the basis of professional leadership by the staff. Even though these activities are carried on in relatively large groups, there will be much joint teacher-student activity.

Activities in the Study phase are typically carried on individually or in groups of two or three. Students work with a minimum of teacher supervision; teachers and other staff personnel serve more as consultants and less as task masters. Conferences between students and teachers will clarify goals, content, and personal problems related to behavioral development. The following verbs indicate the kinds of things students will do: read, listen (for example, to records and tapes), view, experiment, examine, consider evidence, question, analyze, investigate, think, write, create, memorize, record, make, and self-appraise.

Can locally prepared tapes spell off the spelling teacher? Westside Junior High School, Omaha.

These activities will take place in and outside school—in project and materials centers, observation and experience areas, study facilities, libraries, and laboratories. This Study phase wherein students progressively take more responsibility for self-direction will probably occupy about 35 percent of the students' time. Here is where they build upon the experiences they have participated in during the Presentation-Assimilation phase by extending their learnings in relation to individual potential, interests, and goals.

During the Discussion phase students will meet in small groups of approximately 12 students and a teacher. Having experienced at least part of the activities of the other two phases, they will pit mind against mind in an effort to sharpen appreciations and understandings and reach areas of agreement and disagreement. This is student-centered activity where teachers play roles of counselors, consultants, and evaluators of process. Typically this phase which can occur at various times during the process of study will occupy about 25 percent of the student's learning time.

Professional teachers will strive continuously to see which purposes and which content is most effectively and efficiently achieved in each of the three foregoing phases. Decisions will be made in terms of differences among individuals, groups, and subject areas regarding relative times to be spent, sequences, the most appropriate learning activities, and resources; there will be variety in the patterns followed.

There will also be frequent regroupings of students in terms of individual abilities, interests, and needs. Flexibility of grouping is a key characteristic; individuals are not placed in a group for one semester or for an entire year.

The use of a variety of audio-visual materials are essential in all three phases. Although further experimentation is needed in order to determine what kinds may be most productive, some illustrations from the current NASSP studies may be indicative.

During the Presentation-Assimilation phase where larger than usual groups are taught in settings not designed for regular instruction, material aids are indispensable. Closed and open-circuit TV, Vu-Graph and other projectors, tape recordings, mock-ups, flannel boards, and other aids are being used effectively on an everyday basis. The Vu-Graph seems especially useful because it does not require darkened rooms and uses materials that can be readily prepared locally.

Both locally prepared and commercial materials seem essential on the whole. Space prohibits detailed descriptions, but potential uses will be realized easily by most readers of this journal.

During the Study phase, students in resource centers need to view slides, films, and pictures, listen to tapes, and study models and mock-ups. Records, tapes, filmstrips and other materials are taken home, which represents quite an improvement over typical homework. Additional self-teaching and appraisal devices need to be developed so that students can work and achieve immediate psychological reinforcement without the physical presence of the teacher.

The Discussion phase is primarily one of oral communication, but it is conceivable that students will bring flat pictures, tapes, models, etc. as resource materials. With everyday

experience in audio-visual materials, they will not likely revert solely to printed materials to make their points in discussion.

A competent classroom teacher wishing to instruct 100-150 students on how to outline, how to get the central idea in a paragraph, how a rocket engine works, or what life was like at the time of the American Revolution needs help, let us assume, in the preparation of animated transparencies with multi-colored overlays. Another needs help in planning the use of audio-visuals that will make a closed-circuit TV lesson more effective. Still others need assistance in acoustical and other problems faced in preparing and using teaching tapes and recordings. Teachers also need help in developing and using heretofore unrealized types of material aids. Imagination and creativity should add to present know-how.

Challenge to AV Specialists

Are audio-visual specialists ready to go beyond ordering films and training projection crews? As conceived in several of the NASSP experimental studies, teaching should be viewed as a team activity wherein different members of the professional staff, aided by paraprofessional assistants and clerks, provide those services for which they are particularly competent and in which they are most interested. They should be in physical confrontation with groups of students fewer hours per week so that they have time to prepare instructional materials, confer with individual students, improve evaluation, keep up to date in knowledge and research, and do other things characteristic of professional persons. In such a framework, audio-visual specialists, art teachers, and others will work as teams in planning, preparing, and presenting materials for the Presentation-Assimilation and Study phases of instruction.

Much additional experimentation is needed in improving the quality of education and making better use of teacher competencies. One way in which audio-visual specialists can contribute is by keeping informed of the experimental studies sponsored by the NASSP Commission and by taking the lead in stimulating interest in experimentation in their own school systems.

NASSP Study Brims With AV Implications

THE JANUARY 1958 issue of *The Bulletin of the National Association of Secondary-School Principals* is filled with data that has very special implications for educators concerned with instructional materials. Subtitled "New Horizons in Staff Utilization," it is a report on experimental studies made by the National Association of Secondary-School Principals' Commission on the Experimental Study of Utilization of the Staff in the Secondary School ($1.50 from NASSP).

The studies, made possible through a special grant from the Educational Division of the Ford Foundation, took place in schools throughout the country during 1956-57. Many of the chapter-length reports are written by staff members of the schools in question: superintendents, principals, and classroom teachers.

Three of the 20-odd chapters deal exclusively with audio-visual methods: Chapter IV, "Closed-Circuit Television Is Used at Evanston Township High School"; Chapter VII, "Tape Recordings Are Used To Teach Seventh Grade Students in Westside Junior-Senior High School, Omaha, Nebraska"; and Chapter X, "Changes in Class Size, Teacher Time, and Use of Electronic and Mechanical Aids are Made in Snyder, Texas."

The staff categories proposed for the instructional program of the future by J. Lloyd Trump in a lead-off chapter are challenging ones. The audio-visual educator will be interested in seeing his relationship to staff and curriculum in this hierarchy. He will also be pleased to note the emphasis on enrichment via learning resources—television, radio, disc recordings, electronic tape recordings, films and slides, mock-ups, books, magazines, pamphlets, and other materials.

The Evanston Township account of the use of closed-circuit TV in typing and English-Speech courses reveals an extensive experiment in which 20 classrooms were outfitted with 21-inch TV receivers. On the whole, the school was pleased with the result; however, the report lists 11 "difficulties encountered" along with 11 "plus factors" and 10 factors that remained unaffected. Readers of this magazine are likely familiar with many of these plus and minus factors in TV teaching, but one that may be of interest came as a result of using films via TV. Teachers found it more satisfactory from a mechanical point of view than regular projection with its miscellany of trivial but necessary details, such as pulling shades.

In the Omaha experiment answers were sought to these three questions: Can spelling be taught to 100 or more junior high-school students by specially prepared tape as effectively as it can be taught to 30 by separate teachers? Can modern languages be taught in the grades by tapes prepared expressly for pupils by linguists? What are the savings in teacher effort and salaries, in the cost of books and classrooms?

The Snyder (Texas) report is a thorough analysis of the use of TV in general science, biology, and English. It shows how teachers learn and improvise as the experiment develops, the growing influence of pupil participation, and the importance of parental attitudes. The authors, after a description of evaluative techniques, state that it is too early to judge results but that reactions warrant further development of the project.

New Trends in Buildings

How the structure of the school plant affects curriculum development is outlined in a chapter written by members of the school staff at Syosset, New York. The new Syosset High School is a cluster of "four little schools," each consisting of 10 classrooms, a unit library, several work areas, and a curriculum workroom. These surround a large open "project area" for common use. Combined classes in English and art, and team teaching in social studies and English are described as logical results of utilizing this kind of school plant.

The foregoing is only a sampling of the information contained in these 262 pages. The discoveries made through these NASSP experimental studies are so vital and bear so strongly on AV that certainly this volume should be adopted into the literature of the field.

—EDWARD T. SCHOFIELD

a nationwide experiment

tv for large classes

by john j. scanlon

THE National Program in the Use of Television in the Public Schools, under which more than 50,000 boys and girls in more than a hundred school systems throughout the country are receiving part of their instruction by television, is now in the second semester of its first year. Although it is much too early to talk about definite results, this article will attempt to give a brief report on the progress of the program to date.

The program, jointly financed by the Fund for the Advancement of Education and the participating school systems, got under way last September. Participating are school systems in ten major cities (Atlanta, Cincinnati, Detroit, Jefferson County [Louisville,] Miami, Milwaukee, Norfolk, Oklahoma City, Philadelphia, and Wichita), 19 large-city systems in North Carolina, and some 75 small-town systems in Oklahoma and Nebraska.

The major objective of the program is to determine whether it is feasible to teach large classes by television without sacrificing quality, but there are other aspects too. In Nebraska, for example, teachers in Lincoln, the state capital, are reaching out with a combination of open-circuit television and correspondence-course materials to bring courses in algebra, geometry, physics, English, and Spanish to students in rural high schools who otherwise might miss these opportunities because of the lack of qualified teachers. The same effort is being made in the state of Oklahoma, except that correspondence-course materials are not being used.

It is also hoped that the experiment will provide evidence on these questions:

1. The kind and amount of services other than televised instruction needed to set up optimum conditions for learning.

2. The scheduling and school building problems involved in teaching large classes by television, and whether or not these problems can be met at low cost and without sacrificing quality in instruction.

3. The budgetary implications—both capital and operating—of the savings in teacher time, in building space, in equipment, and in other teaching aids.

4. How best to develop teacher talent, not only for television, but also for teaching larger classes in regular classrooms.

Participating in the experiment are about 30 elementary schools, 70 junior high schools, and about 150 high schools. Subjects taught by television range all the way from third grade conversational Spanish to 12th grade physics, and include such subjects as arithmetic, general science, health, American and world history, biology, American literature, music, safety, art, English, algebra, plane and solid geometry, general mathematics, chemistry, geology, driver education, and social studies.

To assist the participating school systems and the Fund in evaluating the Program, two committees of educators and testing experts have been established. The first, known as the Appraisal Committee, is headed by Herold C. Hunt, Eliot Professor of Education at the Harvard Graduate School of Education, and is charged with the responsibility of appraising such things as the quality of instruction, techniques, and procedures of teaching large classes, the physical arrangements of the large classes

scheduling problems, and so forth. Other members of this committee are Parmer Ewing, professor of education at New York University; J. Chester Swanson, professor of education at the University of California at Berkeley; Charles A. Siepmann, chairman of the department of communications in education at New York University; Arnold Perry, dean of the School of Education at the University of North Carolina, and Leslie W. Greenhill, assistant director of the Division of Academic Research and Services at Pennsylvania State University.

The second committee, known as the Evaluation Committee, is headed by Arthur E. Traxler, executive director of the Educational Records Bureau, and is responsible for advising the participating school systems in the testing of student achievement and attitudes. Other members are Howard A. Bowman, director of the Evaluation and Research Section of the Los Angeles Board of Education; C. Robert Pace, director of the Psychological Research Center at Syracuse University; Warren G. Findley, assistant superintendent for pupil personnel services in the Atlanta public schools, and Henry S. Dyer, vice-president of Educational Testing Service at Princeton, New Jersey.

Matching Performances

Each participating school system plans to match the performance of the "TV" students with the performance of "control" students who have received their instruction in the conventional manner. Pre-tests were given shortly after school opened last September, and post-tests will be given shortly before the close of school in June. Although the evaluators agree that no final conclusions can or should be drawn on the basis of the first year's results, it is hoped that enough objective data can be assembled to warrant at least tentative hypotheses. In addition to testing student achievement, the evaluators are developing instruments for testing student attitudes toward televised instruction and are collecting other data through the use of "feedback" cards and informal "logs" in which studio and classroom teachers are asked to record "critical incidents" that appear to have a direct bearing on the experiment's central purpose.

At a recent meeting in Philadelphia of superintendents, local project directors, evaluators, and other representatives of the participating school systems—some 100 persons in all—it was agreed that each school system would send the Fund a progress report at the end of the first year and that the Fund, with the advice and counsel of the Appraisal and Evaluation committees, would publish a general report based on the information in the individual reports.

The Score So Far

The Philadelphia meeting was sponsored by the Fund to bring the local project representatives together for an exchange of information and ideas and for a discussion of the problems they had encountered during the first half year of the experiment. Here are some of the problems, questions, and tentative observations which emerged from the discussion:

1. The studio teachers, classroom teachers, and "TV" students are working harder than they have ever worked before, but they enjoy it.

2. A spirit of "team-work" is beginning to develop between the studio teachers and the classroom teachers. They are coming to realize that each has an important role to play in the total teaching job, and they are working together to improve both the telecast part of the lesson and the classroom "followup."

3. The nature and length of the telecast and the nature and length of the "followup" are being carefully studied in an effort to determine the ideal combination of the two in different classroom situations, in different subject-matter areas, and at different grade-levels.

4. The techniques of teaching—and learning—in large-class situations have by no means been mastered, but both teachers and students are working hard to develop and improve them. Teachers are learning how to elicit student participation, both during and after the telecast, and students are learning the arts of note-taking and of speaking clearly and distinctly in the large classes.

5. In many instances, the physical arrangements in the large classes leave a lot to be desired. In some auditoriums the acoustics are bad and the students find it difficult to take notes because of physical conveniences needed but lacking. Lighting has not been much of a problem.

6. The problem of providing for individual differences in student ability remains a major one, but in most of the school systems the teacher time saved by the use of television is used to provide added individual instruction for both slow and rapid learners. (The telecast part of each lesson is usually "pitched" at the better-than-average student, but the studio teachers and classroom teachers are beginning to learn that by skillful use of reviews, short quizzes, and other techniques of reinforcement they can bring the average and slow learners along at a faster pace than they had thought possible.)

7. The use of television as a medium of instruction has in many instances brought about a re-thinking of the curriculum and course objectives. (One superintendent reported: "What we are doing with TV is not as important as what TV is doing for us. It has provided a means to do naturally what we have always tried to do artifically.")

8. In most of the school systems, teachers not in the experiment are learning a lot by observing the techniques used by the studio teachers. (As one superintendent put it: "Even the best teacher can learn by observing other teachers.")

9. Since all but one of the projects in the National Program employ open-circuit (rather than closed-circuit) television, they find that they have a much wider audience than the students in the classrooms. Parents—especially mothers—are tuning in on the telecasts, and in one city several mothers enrolled in night-school Spanish courses so they could keep up with their youngsters who were taking third grade conversational Spanish. In another city, one of the best "students" has proved to be a 77-year-old retired undertaker who never had a chance to finish his formal education, but is now catching up by "taking" every course offered by television.

Most, and maybe all, of the participating school systems will continue the experiment next year, and several plan to expand it to include more students, more subjects, and more grade-levels.

SCIENCE

renovating the PHYSICS course

by stephen white

FOR MORE THAN 18 MONTHS, the Physical Science Study Committee has been engaged in the production of a thoroughly revised physics course for secondary schools. The new course is intended to present the major developments of physics as an integrated whole, to present the subject itself as a vital intellectual and cultural pursuit, and to assist teachers in conveying these aspects of physics to their pupils.

To further these ends, the Committee has gathered a large staff, headed by college and secondary school teachers of physics. This staff is now supervising the production of a new textbook, laboratory and demonstration material, films, supplementary booklets for students and teachers' guides.

In this ambitious program, the motion picture plays a most important role and one for which it is uniquely suited. Its most important contribution is one that can be discussed even prior to any concern for the specific subject matter with which the films will deal or the manner in which that subject matter will be treated.

The films are expected to set the tone and level for the entire course. The high school student will see real scientists dealing rigorously and respectfully with real problems, and deriving not only satisfaction but excitement from the intellectual pursuit in which they are engaged. On the printed page of the text, the trivial and the momentous are sometimes difficult to differentiate; on film the one can be brushed aside and the other dwelt upon. The scientist appears not as a disembodied intellect but as a normal, active, occasionally fallible human being. His occupation is a highly satisfying human activity. On film as in no other medium the student can see how questions arise, how they are met, and how they are disposed of.

In short, the films will serve to solve a teaching problem that is not peculiar to physics but that runs through the entire educational process: the problem of the gap that so frequently arises between a science or a humanity as it is taught in school, and the same science and humanity as it is actually carried on by its practitioners. Part of this gap lies in the choice of subject matter, and the revision of the textbook is designed to cope with it to that extent. But the difference in tone and in level is beyond the capabilities of the text. Only the film can do it at all, and only the good film can do it well.

TO FULFILL this function, the committee intends to prepare approximately 70 films, each about 20 minutes long. The initial preparation of each film will lie in the hands of the Committee and contributing physicists and writers; production will be contracted out among various commercial organizations, with the largest portion going to Encyclopaedia Britannica Films. Studio shooting will be done for the most part in facilities now being prepared by the Committee in Watertown, Massachusetts.

Beneath this apparent simplicity, as the Committee is well aware, there lies all sorts of complexities. There must yet be determined what subjects are to be covered in the films, how shooting scripts are to be prepared,

what technical requirements the films are to meet, and finally what the format of the films is to be. Each of these constitutes a problem of some size, and there is no disposition to solve those problems out of hand. Rather, the approach of the committee is one of experimentation. Certainly, at this stage we are trying to find out *how* to make films as much as we are trying to make them.

These films are to be shown in schoolrooms to students of high school physics at the rate of two a week during the school year. They will constitute a classroom activity in which both students and teacher take part; they are neither intended to replace the teacher or to pre-empt a portion of his work. The teacher will teach from film, text, and lab manual just as in other circumstances he would teach from text and lab manual alone.

The subject matter of the films under these conditions must be such that they will enter into the general educational flow from the beginning to the end of the term. They cannot go off in directions of their own but must complement the text and lab. But although this is necessary, it is not sufficient to define the films. The question still remains: should the films parallel the text from start to finish, offering an audio-visual alternative to the printed text? Or should they select from the text those portions which lend themselves most effectively to cinematic treatment, ignoring the step-by-step continuity of the course?

To be more specific, let us consider the subject, "Light." Should the film parallel the text, chapter by chapter? Or should it be reserved for those aspects it does surpassingly well, such as wave motion and measurement of velocity and pressure, ignoring such matters as ray-tracing on the assumption that they can be taught most adequately in classroom and lab?

FOR THE FIRST of these two procedures, it can be argued that the films would constitute a powerful reinforcement for the entire text, and would particularly serve that large portion of the student body who by their nature respond most actively to audio-visual stimuli. But the alternative also has its merits. It would leave time for the films to do extensively those things which cannot be done in classroom or lab: the experiments that are beyond the resources or the means of the school; those that might take a month in a laboratory but can be shown in minutes on film; the phenomena for which it is necessary to leave the classroom and go out into the world—or into Palomar.

Both views—and a third view as well—have their proponents in the Committee. Some members think that the problem is in fact more illusion than reality. It may well be that the decision to make or forego a given film will be determined by the enthusiasm with which a physicist and a writer entertain the prospect of making that film.

Preparation of shooting scripts is intended to remain flexible. The basic procedure will be to assign a subject to a physicist or group of physicists who have agreed to prepare an outline of the subject matter they propose to cover. The outline will be subjected to critical review by other physicists and by high school teachers, and to a lesser degree by those who will be responsible for production. It will then be returned to the author (or authors) for revision. On the basis of this revised outline, a treatment will be prepared by a film writer, translating the material into cinematic terms. This treatment in turn will undergo critical revision. With an approved treatment in hand, the responsible physicist and the screenplay writer will prepare together a shooting script which must meet the requirements of both physicist and producer.

HERE AGAIN, the basic procedure is subject to any kind of variation. The problem is to provide a finished script which will result in good film, good physics, and good pedagogy. Any means to these ends will be entirely acceptable to the Committee. Certain physicists, for example, have expressed an interest in making their first draft in the form of a "home movie" or a filmstrip. Either would be entirely acceptable.

Technical requirements seem to be set by the equipment generally available in high schools, that is, equipment projecting 16mm optical-sound color film. The Committee would naturally prefer 35mm double system color, although it is clear that the cost of producing such films, making prints, and refurbishing the nation's projection systems would be staggering.

The Committee, perhaps presumptuously, is firm in the belief that this is an area where invention is necessary and is prepared to undertake it in the near future. The goal will be the development of a cheap, highly efficient, "school-proof" projection system which will deliver high quality pictures at tolerable cost. Some ideas have already been developed, but for the moment the Committee will necessarily deal in a product that can be put directly to use in the schools.

No Rigid Pattern

The final question, that of format, is one that the Committee intends to leave unresolved. It seems preferable that each film be considered individually, and a style adopted best calculated to serve the purposes of that film.

The one finished film on hand, on the Pressure of Light, is set at a laboratory table and employs a lecturer who is on camera during virtually the entire film. Other films will be set in actual classrooms, with and without student participation. Still others will employ a narrator rather than a lecturer. Certain films will be shot on location. Finally, films will employ combinations of all these techniques, and no doubt of others that have not been mentioned here.

Animation will be used sparingly, for an assortment of reasons, some of them economic and some pedagogic. Wherever possible, models will be constructed to do the work of animation. Here, too, a certain amount of invention will be necessary, but it has been agreed by the Committee that models are in general superior to animations in vividness, in plausibility, and in dollars and cents.

Taken as a whole, the program of the PSSC is an immense one and will demand large investments of both time and money. It is expected that we will learn much as we proceed, and that what we learn will be of value far beyond the direct work of the Committee. The Committee does not underestimate the ambitiousness of its film program, nor is it frightened by it. It is, rather, eager to get on with it. By summer, there should be a good deal more to report.

GIFTED CHILD

our unguided missile

FOR PRACTICAL PURPOSES the academically talented can be defined as the upper 20 percent of the student population as measured by tests of developmental ability together with records of school achievement. From this group come the future leaders in government, business and the professions.

Academically talented boys and girls do not necessarily become educated by themselves. They need trained teachers, enriched courses of study, and adequate teaching facilities. At the present time too many fall by the wayside because the school, geared to the average or slow learner, neither stimulates the gifted student nor works him to capacity. Certainly, the upper 20 percent deserve as much special consideration as the academically handicapped.

To consider what the public schools can do to nurture the capabilities of these gifted pupils, the NEA in February sponsored a two-day conference in Washington, D. C., attended by 200 educators. Out of these sessions came five special reports in the form of recommendations of sub-committees concerned with English, social studies, foreign languages, science, and mathematics.

[These reports will be published and available from the NEA later this spring. Watch for future announcement in AVI. — THE EDITORS.]

In the main, the Conference agreed on general methods for identifying talented students and on the importance of guidance, particularly, as one Conference speaker put it, "in this era of guided missiles and unguided children."

Identification can and usually should be made in the eighth grade, although there is evidence that gifted students can be identified as early as in the sixth grade. It was emphasized, however, that there should be flexibility in classification to allow for errors in judgment, "late bloomers," and other factors. Test scores together with school marks were commonly agreed upon as the most reliable predictors of talent although one speaker pointed out that test scores have certain advantages over marks in that they furnish a standardized scale independent of teachers' judgments, marking systems, types of curriculum, and environmental factors.

AS BADLY IN NEED OF GUIDANCE as the students, if not more so, are parents and the community in general. If a single point was stressed throughout the Conference it was the need to change the "anti-intellectual climate" that characterizes most communities. Citizens will go all out to help the handicapped person but can see little need for helping the "bright pupil" who, they feel, is well equipped to shift for himself.

Too prevalent also is the attitude reflected by parents who boast that "all we want to do is to raise our kids to be normal, well adjusted adults," or by the successful businessman who, upon discovering that his son has won a scholarship and intends to go into scientific research, bewails this unfortunate decision on the part of his boy who is "completely normal and capable of making a real success."

In his summarizing speech, James B. Conant said: "Many of those here, perhaps all of us, believe that a reorientation of public opinion (including particularly parental opinion) is required if we are to get ahead with the improvement of the secondary education of the academically talented youth."

There was strong sentiment among working groups of the Conference that instruction should, when practical, be organized so that the pupil of high ability in any subject can study with others of comparable ability in the same subject. This does not mean mechanical classification according to IQ; grouping is strictly according to ability, subject by subject. Nor does it mean that gifted children should be isolated from others in all curriculum areas.

The Conference generally endorsed the Advanced Placement Program whereby selected courses are offered at college level. The pupil graduates from high school with his class but enters college with advanced standing and/or credit towards a college degree.

Adding courses to the secondary curriculum was generally recommended by the five sub-committees: the mathematicians called for at least three years of math for all academically talented students, with four

by zachariah subarsky

murray lincoln miller

alexander frazier

and mildred cobb

years for those with special aptitudes; in science the recommendation was for three courses—general science, biology, and a physical science — and a fourth course for interested students. Four years of English was declared the minimum, with a heavy reading program (literature) and much emphasis on writing — both creative writing and teaching the student to say effectively what is meant. Oral expression was limited to reports, panels and discussions. Debating, most dramatic work and public speaking were relegated to speech classes. Journalism was set apart as an elective outside the English course.

Three years of social studies were stipulated and more than two years in any one foreign language. Stressing the importance of the latter, Dr. Conant told conferees: "A great deal is being said about Russian science these days but what is sometimes overlooked is the fact that in those slowly developing countries in which we and the Soviets are to some degree in competition, the Soviet representatives speak the language of the people; the American representatives rarely do."

A significant aspect of the Conference, particularly to the readers of this magazine, are the findings pertinent to the use of audio-visual techniques. In the opinion of many educational leaders, audio-visual aids are useful for slow learners, but less so for brighter pupils who readily achieve information unaided. Contrary to this view, the Conference found that films, tapes, and television can be effective media for providing high-level motivation, expert instruction, enrichment, and vocational guidance to talented students in the field of mathematics, science, foreign languages, and other subjects. Indeed, some significant uses are now being made of the media.

A program for the production of teaching films and other visual aids has been recognized as an integral part of the revision of the high school physics course now in progress at M.I.T. (see article on page 108).

During the past year 9100 students in Nebraska took in-service correspondence courses from 31 teachers who conducted the courses by mail, or with the assistance of the Nebraska Educational Television Station. Next year, Utah plans to broadcast 170 half-hour physics films over an educational television station with relays capable of extending the signal to all parts of the state. There is a possibility that similar films may be produced in other sciences and in mathematics, thus conveying basic subject matter to pupils which is later interpreted by classroom teachers.

Audio-visual materials present an unusual opportunity for independent study, or for study by small groups. By means of tape recordings and films, students are able to study advanced subjects or foreign languages with considerable independence from direct instruction. This is especially advantageous in rural communities and in other areas where course offerings are limited because of teacher shortage.

MOST EXPLICIT in recommending audio-visual aids for teaching the academically gifted was the subgroup that dealt with foreign languages. To quote from its report: "Modern invention has created a large number and variety of mechanical aids which should be used by the academically talented, to increase motivation, to accelerate progress, both in connection with class work and for individual study. The language laboratory with tape recordings and disc records, the radio and television, realia and illustrative materials of all kind, instructional films, kinescopes, and filmstrips are among these possibilities. Further research and experimentation are necessary to determine effective techniques for their optimum use. Care must be taken to integrate them well with the class work and the textbook. We recommend further conferences on these problems, and instruction for teachers in the use of such mechanical aids."

AV Applied to English

The English specialists voiced their preference for teachers "able to make use of the many advantages of the mass media." The school that provides a program for talented pupils, their report states, must recognize the necessity of a good library and must make available audio-visual aids of all types including a "rich library of recordings and films."

Films also found favor in the Conference generally as a means for providing enrichment. Whether an academically talented child is accelerated by rapid promotion from grade to grade, segregated into special groups for advanced instruction in some fields, or perhaps merely given enriched instruction along with randomly selected class members, the need for supplementary and advanced instructional materials is evident. Another important type of film is designed to raise the sights of the talented student and to guide him into socially worthwhile fields of endeavor. Biographic films dealing with contemporary figures in such fields as social and physical sciences can become a great stimulant for this purpose.

Affiliation with the school audio-visual squad offers the talented student an opportunity to create original slides, filmstrips, films, charts, tapes and other audio-visuals. Original projects of this sort can be related to almost any academic subject.

Field trips constitute an important audio-visual technique for providing talented students with concrete ex-

(Continued on page 129)

imagination +

This article is reprinted under its original title in slightly abbreviated version from the October 1957 issue of the Carnegie Corporation of New York QUARTERLY. The Corporation is a foundation interested in higher education and certain aspects of international and public affairs. Educational grants are made for research and experimental projects.

IN AN ATTEMPT to make mathematics enjoyable to American children, Professor Max Beberman and a little band of mathematics experimentalists at the University of Illinois have set out to disprove the old teaching rule that a child doesn't really understand anything that he can't explain in words. They are turning the high school math curriculum inside out to make it fit what adolescents actually feel and think as opposed to the reactions ascribed to them by grownups.

"When you and I were 13 or 14," Beberman reminds his fellow pedagogues, "we were enchanted by the mysteries of life. We weren't concerned with practicalities. We didn't ask ourselves how we would earn our living after we finished school. We wanted to know if there was a God, and if there was, what did He look like? Was He maybe like the light of day or the sound of the wind in the trees? Why was grass always green? Why were clouds always white or grey or sometimes pink—never blue like the sky behind them? The more abstract a question was the hotter we argued it. Angels absolutely delighted us; how many of them could dance on the head of a pin?

"Numbers are as abstract as angels. Mathematics is as creative as music, painting, or sculpture. The high school freshman will revel in it if we let him play with it as an abstraction. But insisting that he pin numbers down is like asking him to catch a butterfly to explain the sheen on its wings . . ."

Rather than asking a pupil to explain the fascinating tricks he sees numbers perform, Beberman and his colleagues discourage verbalization as long as they can without frustrating creative curiosity. Not only is nonverbal awareness enough in the beginning, it is preferable, because the language of mathematics is the most exacting tongue man has ever devised, and it can be mastered only gradually through an initial intuitive appreciation followed by long and patient practice.

To grownups who instinctively reject this philosophy, Beberman, using a favorite practice of his colleague, Miss Gertrude Hendrix, will ask: "Tell me, what is the sum of the first 60 odd numbers?" When a startled hearer pleads for time and a computer, Beberman seizes a tablet of paper and a pencil. "Let's list the numbers here," he proposes, writing:

1st odd number	total of	
2	(1 plus 3)	4
3	(1 plus 3 plus 5)	9
4		16
5		25
6		36
7		49
8		64
9		81

He pauses momentarily and says, "Whenever you think you can tell me the sum of the first 60, stop me" and goes on

Slowly it dawns on his watching companion that each number listed in the right-hand column is equal to the opposite number in the left-hand column multiplied by itself.

This tantalizing relationship between the two columns of numbers delights an adolescent mind. It tempts the question, "What makes it come out that way?" If the child is encouraged to guess the whyfor — as Beberman pupils are—he soon will be formulating the underlying principles of mathematics for himself, in his own ingenious and sometimes ingenuous language, instead of waiting to hear them pronounced by the teacher in words that inevitably bear the unwelcome sound of laws fixed by grownups.

"Why?" is a question which too often atrophies and dies after we leave adolescence behind. Adults who were never freely exposed to math's fascination while they were at the susceptible age—that is, most of us —are far more likely to ask "Of what use is it?" This is the question which all scientists, not merely mathematicians, will recognize as the great "practical" barrier to appreciation of fundamental research.

Professor Beberman may open a broad new avenue for the teaching of all science through his observation that when children ask "What use is it?" they don't really mean it. The brightest pupils never raise the question. Youngsters whose minds are somewhat slower ask it only when they encounter a particular problem they can't solve quickly. Let the math teacher inquire, "What's the problem?" and the emphasis immediately shifts. "What use?" is forgotten. The question was asked in the first place only as an unconscious justification for the child's difficulty.

GROWNUP ANTAGONISM to math is so widespread in America that any approach as seemingly effortless as Professor Beberman's is bound to be greeted with skepticism. But Beberman and his colleagues have accumulated impressive evidence in the last six years to support their argument. Seventeen hundred high school children in a dozen schools (in Barrington, Blue Island, Gurnee, Elmhurst, Pekin, St. Charles, and Urbana in Illinois, in St. Louis, Missouri, and in Chestnut Hill and Newton, Massachusetts) are already studying math according to his method and are successfully learning principles not ordi-

narily grasped, if at all, until the college years. Although word of the course has been spread mainly by mouth and the texts are available only in mimeographed pages, 425 high schools and 128 colleges throughout the country have purchased individual sets of these teaching materials.

Because an entirely new teaching method is involved, every teacher who participates must be especially trained. All who now teach the system have spent at least a couple of weeks in special sessions in Urbana, where the project was launched in 1951 to improve the mathematical understanding of prospective students at the University of Illinois school of engineering.

After returning to their respective classes, the teachers have the continuing benefit of face-to-face consultation with the Illinois staff. Miss Hendrix, teacher coordinator for the project, visits each participating school several times a year, as do Beberman and others. They watch the classes in action, often take over the teaching for an hour or two, and talk with the teachers at length about their various problems and ideas. Between consultations, each participating teacher writes a weekly report on his class's (and his own) progress. He tells what questions the pupils raise, at what points in the text they appear to stumble, what lesson examples get the best response.

These observations suggest constant revision of the text (one reason why the math "books" are mimeographed) and provide a practical leavening of the theories and concepts which Illinois' "pure" mathematicians would like to see taught. But nothing goes in the "books" merely because it appeals to the pupils. The proposed amendments go back again to Herbert E. Vaughan, associate professor of mathematics at the University (his hours as "part-time" consultant to the project are longer than most men's "full time") for a final assurance that the text writing staff has done no violence to mathematical principles.

WHAT COMES OUT in the end is more a change in emphasis than in content. Along with that goes a change in the traditional sequence in which high school math is taught. A full four-year course used to begin with one year of algebra followed by one year of plane geometry followed by another year of algebra followed by a semester of solid geometry followed by a semester of trigonometry. (A relatively small percentage of American high school pupils go the whole route. Many of those preparing for college drop out after the first two years, when the math requirement for entrance to most United States colleges is fulfilled.) Under the Illinois system pupils follow threads of arithmetic and algebra and geometry all through, and so develop a feeling for the essential unity of all mathematics.

To get an idea of how the subjects are woven together, follow the freshman course. Traditionally called "elementry algebra," it is known in the Illinois system simply as "First Course." It is mainly, but not all, algebra. It is also a little arithmetic and a little geometry. And first, last, and always, it is a course in which language receives very careful attention.

On their first day in class, the pupils get copies of a rather pathetic arithmetic test paper done by an imaginary friend living in Alaska. This poor boy thinks that 5 and 7 make 57, and that 9 goes into 99 twice. He also asserts that .000065 is larger than .25, and he can prove it: he measured with a ruler.

The children, who already know a little arithmetic, laugh at his errors. But if they just "know" (that is, have memorized) a little arithmetic without understanding it, they have some trouble at first in saying just how their Alaskan pen pal got so far off base. If you take a '5' and add a '7' to it, don't you get '57'? You do, of course, if you are putting one mark on paper next to another; you don't if you are adding the numbers five and seven. The distinction lies in understanding the difference between a number and its written name (or numeral). The Illinois children are learning that difference, and from there it is only a short step to pronumerals (these are technically called "variables") and their use to satisfy, or "make true," the sentences known as equations.

Once plain equations are familiar, with their comfortable custom of stating the one possible truth, there are also "inequations," or inequalities, in which a number of different statements can be true. For example: $3x$ is *greater than* 6. What is x? It could obviously be 3, since three 3's are nine. It could be $84\frac{1}{2}$. It could, in fact, be any number larger than 2. But this is a problem usually encountered by students in calculus classes. Why teach it in high school?

"We find that introducing inequalities at this level is useful," Beberman explains, "because it teaches kids early that there are many *equations* in which lots and lots of numbers will work. A grasp of this notion will be very important to them in higher mathematics. And it gives them a bet-

(Continued on page 132)

X = learning

MATHEMATICS

by Helen Rowan

LEGISLATION

av and the federal picture

by harrison sasscer

THANKS TO SPUTNIK, public and governmental attention is centered on science and mathematics education. As a result, the audio-visual educator has an audience outside of the profession, an audience willing to accept fresh approaches to teaching science and mathematics. On the other hand, in this audience are some who will quickly reject the use of audio-visual devices as "frills."

Potentially at least, there is both an opportunity and a challenge for audio-visual instruction in many of the bills introduced in the second session of the 85th Congress. Some of these bills are irreverently called "sputnik bills" because they stress science and mathematics education. Other bills represent a concern for basic needs of education at all levels. In either case, these bills are getting exhaustive consideration by the Senate Committee on Labor and Public Welfare and by the House Education and Labor Committee to which most education bills are referred.

But there are other Congressional committees in the picture too. For instance, the Ways and Means Commitee of the House is working on bills to provide tax equity for teachers who take advanced work. The Senate Finance Committee is considering a bill that would exempt private non-profit schools and colleges from federal excise taxes—a substantial benefit when it comes to buying TV equipment.

And, of course, there is postal legislation in which AV educators have been actively interested since 1953 when the Carlson-St. George Act was passed permitting audio-visual materials to be mailed at book rate. During the last week in February a heated and complex debate on increasing postal rates took place in the Senate which had before it a drastically amended version of a bill passed by the House in 1957. Of special interest to AV specialists is the fact that efforts were not successful to remove the permit required of non-profit users of the book rate for mailing audio-visual materials. This permit will still be required, although indications are that the Post Office Department will require little more than an affidavit on the mailing label used by the organization in question.

Since Congress returned in January, more than 50 bills have been introduced which would directly affect education. These are in addition to bills pending from the first session of the 85th Congress. Many of the newly introduced bills are scholarship proposals; several would establish a national science academy along the lines of the service academies; quite a few would provide special aid for improving the teaching of science and mathematics.

In a category by itself is the Murray-Metcalf bill (S 3311 and HR 10763), generally referred to as the NEA bill because it is based on NEA's proposal that the most effective form of federal assistance would be grants for teachers salaries, classroom construction, and basic instructional equipment rather than for specific programs such as science or mathematics. Of this, more later.

Science Education

The two major bills in the science-mathematics category are S 3163 and S 3187. S 3163 was introduced at the request of the Eisenhower Administration by Senator H. Alexander Smith (R-N.J.) and six other Republican Senators. S 3187 was introduced by Senator Lister Hill (D-Ala.) and 26 other Senators from both parties. In the House, the Administration bill was put in as HR 10278 by Representative Carroll D. Kearns (R-Pa.) and as HR 10279 by Representative Peter Frelinghuysen (R-N.J.). (House rules permit only one sponsor to a bill.)

The principal difference between the Administration bill and the Hill bill is one of quantity rather than quality. The Administration bill is a minimal program, limited to a billion-dollar expenditure for four years. It bears every mark of having been put through the wringer by the Bureau of the Budget.

The Hill bill is a six-year program intended to spend about $3 billion in federal funds. Both bills are intended to deal with the immediate emergency need for better education in science and mathematics, although the Hill

bill would include modern foreign languages. Both bills would provide scholarships and fellowships without specifying that they be in particular fields.

Both bills also provide grants to the states to be used for purchasing equipment for teaching science and mathematics. The Hill bill adds modern languages and calls for $40 million a year for six years to be matched by the states. The Administration bill provides $150 million a year for four years in matching grants, but the funds can be used by the states either for equipment or to pay salaries of science and mathematics teachers as the states and local districts prefer.

The Administration bill authorizes the establishment of special foreign language institutes and research centers at colleges and universities for which $1 million to $3 million a year in federal funds would be available on a matching basis for four years. Some of this money could be used to purchase special AV aids for teaching languages.

The Hill bill is more generous in making available to colleges and universities $40 million a year for six years in matching grants to purchase equipment needed to teach science, mathematics, and foreign languages. These funds could be used not only for buying equipment but for altering existing physical facilities as well.

Still another feature of the Hill bill that would involve audio-visual educators is the use of federal funds to reimburse selected teachers who attend summer school or take extension courses. Special consideration would be given to teachers wishing to do advanced study in science, mathematics, and foreign languages. These teachers would receive a stipend of $75 a week with extra allowances for dependents. Teachers taking extension courses would get smaller stipends but they would get their tuition and fees paid from federal funds.

Science Facilities

Another approach to the science equipment program is suggested in a group of bills to authorize $100 million in federal loans for constructing and equipping science and library facilities. This program would be an extension of the existing college housing loan program which has been in operation since 1950.

A minor bill, but one that could be of substantial benefit is S 3155 by Senator Ralph Flanders (R-Vt.) to permit educational institutions to import science equipment duty-free. Still another bill related to tariffs on importation of educational material is HR 7454 which passed the House on February 27 and is pending in the Senate Finance Committee. This bill would permit educational institutions to import films and recordings duty-free for use in non-profit broadcasts and telecasts.

NEA Bills

A bill which should concern all members of the profession is HR 4662, the King-Jenkins bill to permit teachers a tax deduction on the cost of further education. HR 4662 is getting considerable support from members of the House of Representatives, but it still faces some hurdles. One of these is the Senate Finance Committee; teachers interested in securing the benefits of HR 4662 should remind their U. S. Senators of the need for passing such a bill.

Even though action on tax bills must originate in the House, a dozen Senators have shown their interest in teachers' tax problems by introducing bills similar to HR 4662.

Most of the bills discussed in this article are directed to specific and, in some cases, emergency needs of education. But beyond these short-term needs is the problem of paying for the kind of education American children deserve. To meet this need NEA sought the cooperation of two long-standing friends of education in Congress, Senator James E. Murray and Representative Lee Metcalf, both Montana Democrats. In association with several of his colleagues from both political parties Senator Murray introduced S 3311 while in the House Representative Metcalf introduced the identical bill as HR 10763. The fundamental principles of the Murray-Metcalf bill are two: permanent sharing by the federal government with the states of the cost of public elementary education; and, complete state control over the use of federal funds as between teachers salaries or classroom construction including basic instructional equipment.

"Come now, Miss Blakely, your class isn't that large."

S 3311 and HR 10763 would authorize first year federal grants of $25 per school-age child, rising to $100 per child in the fourth year and each year thereafter. If each state were to apportion this money between salaries and construction (including basic instructional equipment) along current national trends approximately 65 percent would go for salaries. This would be sufficient to provide a $500 increase in each public school teacher's salary in the first year of the program.

What, then, are the prospects for action on such legislation? Unless the teaching profession and the public demand it, legislation like the Murray-Metcalf bill will probably be pushed aside for "sputnik bills." This means scholarships and perhaps some funds for science equipment in elementary and secondary schools. But when and if the profession realizes what the NEA bill could do for the schools, and when and if the public realizes that they cannot pay for the kind of schools they want from local property taxes, the Murray-Metcalf bill will point the way to an effective solution to the school finance problem.

The Department of Audio-Visual Instruction of the NEA and the NEA Division of Legislation and Federal Relations work together closely on legislation affecting the interests of AV education. The Division invites DAVI members to write for further information about legislation discussed in this article. Address inquiries to J. L. McCaskill, Director, NEA Division of Legislation and Federal Relations, 1201 Sixteenth St., N. W., Washington 6, D. C.

Task Forces in Brief

NSTA—

PRINTED BELOW are excerpts from a report by John S. Richardson, chairman of the Commission on Education in the Basic Sciences formed last spring as a motivating arm of the National Science Teachers Association for the improvement of science instruction. The report was printed in the *Science Teacher* for September 1957 after the Commission had met twice in Washington during May and June.

Initial discussions presented and led by Professor S. Ralph Powers, Emeritus of Teachers College, Columbia University and Dr. William G. Pollard, Director of Oak Ridge Institute of Nuclear Studies, developed clearly the social responsibility of schools as well as the need for a more functional approach to science teaching than has generally been found in the past. The critical need for a reappraisal of the role of the science teacher was analyzed, with particular reference to the teacher education programs in those institutions that prepare science teachers.

. . . The variegated nature of science teaching and teacher preparation (both preservice and in-service) attests the makeshift attention being given by some schools to their science programs and the significant possibility of ineffective and inefficient efforts by well-intended but uninformed persons and agencies toward the improvement of the qualifications of teachers. Recognizing that some efforts to help teachers hold much promise, the commission senses the need to assay the present situation in the teaching of science in this country. This need should be met insofar as it is possible to meet it.

The commission has set for itself five goals . . . to be developed as rapidly as feasible. They are:

1. The development of a policy statement for the guidance of the commission . . .
2. The development of a survey plan by which a "map" of the present known terrain of science education can be studied.
3. The development of a plan to study experimental teaching in our schools, with conditions so devised that experimental factors can be identified.
4. The development of a plan to identify and study new directions in science teaching. As with all aspects of educational activity, science teaching responds to many factors, including the development of new knowledge, new insight into the educative process, and new demands by society. Such changes should be identified.
5. The development of a guide which will give direction and help to those who wish to study the science programs in their schools . . .

NEA—

AN EVALUATION of present-day education on the elementary and high school levels has been launched as the first project of the newly formed NEA Council on Instruction. The Council in its initial stage is composed of staff representatives from NEA departments, committees, and divisions primarily interested in instruction. DAVI has been active in its formation.

The purposes of the Council's first project, as described by Lyle W. Ashby, assistant executive secretary for educational services of the NEA, is to "provide some general guidelines which professional and lay leaders may find valuable in dealing with such frequently raised questions as: How can we evaluate our present school curriculum in view of the needs of modern society? How can the quality of our educational program be evaluated in the local system? What is the role of national testing programs? To what extent does our present program provide 'education for all'?"

The evaluation will be under the direction of Doak S. Campbell, former president of the University of Florida and widely known for his work in the field of curriculum development. Dr. Campbell will also coordinate plans for a seminar on educational evaluation scheduled for NEA Headquarters later this month. Seminar participants will include specialists in school administration, supervision, curriculum, testing, child growth and development, citizen interest in education, and such areas as the humanities, arts, physical science, and the social sciences.

The activities of the Council are made possible through the Expanded Program voted at the NEA national convention last June.

NASSP—

THE PLACE of science and mathematics in the comprehensive secondary-school program was pondered by 2100 secondary school principals for three sessions during the Fourth Annual Meeting of the National Association of Secondary School Principals at Indianapolis in February.

Discussions were carried on by 100 buzz groups, using as working papers a tentative statement of recommendations made earlier by an *ad hoc* committee in Washington, D. C. Whereas the secondary principals were in accord on the general principles stated, the specific minimum requirements for course offerings were accepted with reservations. This section of the statement will be revised by the NASSP Committee on Curriculum Planning and Development.

In any case, certain trends are unmistakable in the thinking of educators today as exemplified by the group of secondary principals at Indianapolis: For able students learning must be accelerated, the work load increased. In mathematics formal algebra is indicated for eighth-graders, a college-level course for seniors in high school. For students with lesser mathematics ability a one-year course emphasizing general concepts was proposed for grade 10, 11, or 12 in the original recommendations. Flexibility geared to student ability was stressed at all times.

For science, the proposed schedule was somewhat the same with a senior-high course recommended for the ninth grade—possibly biology—and a college-level course begun in the senior year. Laboratory experiences in junior-high school science were termed "essential." As in the proposed schedule for mathematics, a general course in science was recommended for students of limited ability. Scheduled for grade 10, 11, or 12 it was described in the working paper as a course to help "youth understand the methods of science and the role of science in today's world."

In their general statement upon which complete accord was reached, the principals called for a re-examination of "traditional and frequently arbitrary" scheduling of courses, grouping of students, and methods of teaching.

Role of Materials Specialist Defined

A Statement Prepared by the Joint AASL-ACRL-DAVI Committee, December 5, 1957

The Joint AASL-ACRL-DAVI Committee was appointed in the spring of 1955 as a result of general sentiment that classroom instruction would benefit through discussion of common problems by official representatives of the three organizations concerned.

One outcome of discussions to date is the statement printed below which accomplishes two things for the first time: it presents an agreement at the national level between AV and library personnel on what kind of instructional materials program should be developed; it recommends a basic program of preparation and experience for those working as materials specialists regardless of professional background, title, or position. The statement has been endorsed for publication by the AASL and ACRL executive boards and by the DAVI Executive Committee. We hope DAVI members will study it carefully. —THE EDITORS.

THE THREE PROFESSIONAL organizations represented on the Joint Committee are the American Association of School Librarians and the Association of College and Research Libraries, both divisions of ALA, and the Department of Audio-Visual Instruction of the NEA. These organizations share a basic interest which is the maintenance of high educational standards and continued improvement of instruction in American schools, colleges, and universities.

In recent years, many new types of instructional materials and equipment have been developed, such as educational television programs, specialized training devices, and new projection materials. At the same time, more familiar media such as books, films, and recordings have been made increasingly effective through modern techniques of illustration, improved design, and new production processes. In addition to tangible media, the concept of "instructional materials" includes such community resources as individuals who can make a significant contribution and the use of firsthand experiences in the field. All instructional materials now available, and others yet to come, are needed to secure effective and efficient utilization of educational facilities and teaching personnel.

Each type of material has a unique contribution to make to the educational process. Some materials will be more effective in achieving one teaching or learning objective; others will serve another purpose better. There is no basic competition among instructional materials. The point is that in any situation the distinctive characteristics of each medium should be recognized and all appropriate materials should be used.

Because of the broad variety of media now available and the rapid increase of production within each medium, teachers are faced with a vast reservoir of instructional materials from which to choose. This means that teachers require more and more help from specialists to locate, evaluate, select, produce, and use instructional materials to best advantage. In order to provide such help specialists need to have a working knowledge of the entire range of media, the potential contributions each can make to learning, and effective methods of use.

The professional associations named in this statement, together with other professional organizations, such as those concerned with curriculum improvement and with educational television, are vitally concerned with the study, development, and application of all types of instructional materials. They also have in common important responsibilities for recruitment, professional education and certification of school, college and university staff members who now or in the future will serve as specialists in this field. The Committee agrees that certain knowledge and specific skills, as outlined below, are essential in the professional education of librarians, audio-visual specialists, and others who have a primary responsibility for instructional materials.

Prerequisites for Attainment of Professional Status by Instructional Materials Specialists

In light of the significance of instructional materials specialists to the total educational program, it is necessary that there be definition of responsibilities, of required competencies, and of the means by which these competencies can best be developed.

Under consideration here is the professionally competent instructional materials specialist at all levels. By "instructional materials specialists" are meant those individuals who, on a professional level, are directly responsible for a school, college, or university program of counsel, service, or in-service education for student and teacher use of instructional materials. The distinction between the optimum qualifications of the beginning professional worker and of the director of a system-wide program is essentially one of degree and not of kind.

Those personal characteristics and abilities necessary to be effective in working with people in a leadership role become of major importance when that role is one of improving teaching and learning. To fulfill this role is the primary responsibility of instructional materials specialists. Their province is the materials of learning and teaching. The challenge is that of developing increasingly effective use of all types of materials by teachers and students. The measure of their success is the quality of teaching and learning which results.

Looking ahead to the future, the Joint Committee believes that the knowledge and basic skills required for instructional materials specialists to do professional work in education, and the most likely sources of obtaining basic competencies, are as follows:

1. *Successful teaching experience:* Instructional materials specialists should first of all be experienced teachers. This experience may be acquired by years of classroom teaching, or, in the case of those who enter the profession without experience, through an organized internship program following the completion of their course work. It is essential that instructional materials specialists secure experience on curriculum committees and that they gain experience in guidance and supervision.

2. *Foundation areas:* Instructional materials specialists should have course work in (a) educational administration and supervision, (b) principles of learning, (c) curriculum development, (d) guidance and counselling, and (e) mass communications. Furthermore, they should demonstrate a working knowledge of research methods as applied to instructional materials.

3. *Specialized areas:* Instructional materials specialists should have course work and in-service experience in the following areas relating directly to the nature and effective use of materials: (a) analysis of instructional materials, their nature and content; (b) methods of selecting and evaluating materials, through study of individual media as well as through cross-media study by curriculum unit or grade level; (c)

(Continued on page 119)

within the DAVI family

OAVA Hears EBF President

Members of the Oregon Audio-Visual Association heard EBF President Maurice Mitchell speak on "AV for the Sputnik Era," as banquet speaker for their winter meeting at Oregon State College in Corvallis.

Other attractions were an educational film festival with Jack Goodman of the department of visual instruction, Oregon State System of Higher Education, as moderator, and a symposium on these four aspects of selling the audio-visual program: to the community, Orville Bailey, principal, Reedsport High School; to the teacher, Lillian Farley, Coos County School Superintendent; to the administrator, Florence E. Beardsley, director of elementary education, Oregon Department of Education; and, evaluating AV services, Jack Edling, director, instructional materials, Oregon College of Education.

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Chet Ulin, director of audio-visual education for the Bremerton (Washington) public schools, gave the kick-off talk on "Mood and Music," and a later presentation, "Audio-Visual Hi-Jinks." Don Hunter, director of the audio-visual department, University of Oregon, demonstrated "tape recorders in action."

Arizona Has Big Meeting

Joel A. Benedict, director of the audio-visual center at Arizona State College, reports that appearance on the program of Robert deKieffer, Adrian TerLouw, and Maurice Mitchell gave "great stature and attracted a very large audience" to the spring conference of the Arizona Association of Audio-Visual Education. Mr. Benedict said that attendance was doubled at every meeting and added that commercial exhibits had grown from three a few years ago to 28. The conference drew educators from Nevada, New Mexico and Arizona.

Bob deKieffer gave a special report as president of DAVI; Mr. TerLouw's topic was "Seeing for Learning," and Mr. Mitchell's, "Sounds, Sights, and Satellites." Alexander Frazier, assistant superintendent of Phoenix Union High Schools, spoke on the role of audio-visual education. There were demonstrations of teaching biology with closed-circuit TV; do-it-yourself techniques for junior-high science; arithmetic and the flannel board; and one by the Moody Institute of Science.

The Association elected James Cacceleto as president and Clark Shelby, vice president.

Schuller in Syracuse

Charles F. Schuller, president-elect of DAVI, and Clyde K. Miller of the Ohio Department of Education, were principal speakers at the tenth anniversary meeting of the New York State Audio-Visual Council.

Speaking on the topic, "The Next Ten Years," Dr. Schuller recommended: (1) that one percent of the instructional budget be earmarked for audio-visual materials; (2) that one person be employed to administer both the audio-visual program and library in small schools where no one has yet been hired in either capacity; (2) that persons in audio-visual jobs work under the director of the curriculum.

Mr. Miller showed slides describing the program of one-day workshops conducted throughout Ohio.

During the business meeting Donald P. Ely, Syracuse University, and Irene F. Cypher, NYU, gave progress reports on behalf of the Certification Committee and the Building and Grounds Committee, respectively. Dr. Cypher announced that a three-state meeting had been scheduled at NYU for July 16-17 to consider the problems of the last named committee. Later the Council voted to hold its summer meeting at the same time and place.

Officers elected were: president, Clair Armstrong, Niagara Falls; vice president, John McCabe, Long Island; secretary, Toby Venner, Syracuse AV center; and treasurer, Richard Hubbard, also of the Syracuse center.

Leadership Conference

Seventy-five AV specialists from the six New England states, New York, and New Jersey attended the second annual DAVI Regional Leadership Conference in Boston January 30-February 1. David R. Mackey, chairman of the division of communications arts, Boston University School of Public Relations and Communications, was the keynote speaker. Commissioner of Education Owen B. Kiernan of Massachusetts welcomed participants among whom was Anna L. Hyer, executive secretary of DAVI, as special guest of the Conference.

Information Wanted

Fred Winston, chairman of the School Service Corps Committee, requests information from states, counties, and cities where AV squads from individual schools have been incorporated into larger groups having a definite form or organization. Here are specific points upon which information would be helpful: What is your organizational pattern? How do school groups and individuals qualify for membership? What obstacles were met during the organizational stages? How is your program administered? What are the sources of revenue? Mr. Winston can be reached at JHS 14, Avenue X and Batchelder Street, Brooklyn 35, New York.

Field Service Program Granted New Funds

THE BOARD OF DIRECTORS of the Teaching Film Custodians has granted a request for $1500 which will enable the DAVI Field Service Consultant Program to continue its work during 1958-1959. This is the second grant from TFC, the first having been made to establish the Program in 1955.

The Program provides experienced consultants to cooperate with schools and colleges seeking to improve instruction through audio-visual experiences. Teams of AV specialists go out to requesting institutions, survey their needs, and make recommendations. Funds from the TFC grants are used to pay honorariums to these consultants. Schools and colleges requesting their services pay travel and expenses.

Since September 1955 when the first group of 15 consultants met at the State University of Iowa to plan the Field Service Program, these projects have been completed with the following AV specialists as consultants: Des Moines (Iowa) public schools, with Paul C. Reed, Rochester, New York, and Mendel Sherman, Indiana University; Harding College, Searcy, Arkansas, with W. C. Meierhenry, University of Nebraska and the late Waldemar Gjerde, Iowa State Teachers College; The University of Virginia, Charlottesville, with Robert E. deKieffer, University of Colorado and F. A. White, University of Wisconsin; Oklahoma City public schools, with W. R. Fulton, University of Oklahoma, and J. J. McPherson, Wayne State University; Southeast Missouri State College, Cape Girardeau, with White and Gjerde; and Arizona State College, Tempe, with Meierhenry and Henry McCarty, Texas Technological College.

Surrounding Area Benefits

In addition to the foregoing, a survey was conducted for the San Diego County school system by Meierhenry and Lee W. Cochran, State University of Iowa. Though unofficial because of lack of funds, it was conducted according to the organizational pattern of the Field Service Program.

Consultants in the Program have indicated that benefits accrue not only to schools and colleges surveyed but to many others in the area receiving guidance from the written reports. (All surveys are written up and discussed with college or school officials before the consultant team leaves.)

Upon recommendations made at the 1957 DAVI Convention that state organizations plan their own survey programs to supplement the national one, the Audio-Visual Education Association of Iowa inaugurated a State Field Service Program in 1956. Planned in full cooperation with the Iowa State Department of Public Instruction, it now provides consultants to many Iowa schools.

Before starting the nation-wide surveys, the original group of consultants to the DAVI Field Service Program developed a brochure of guiding principles. Officers of DAVI affiliates can have copies by writing the undersigned at the Extension Division, State University of Iowa, Iowa City.

—LEE W. COCHRAN
Chairman, Field Service Consultant Program

Joint Statement—continued

utilization of materials; (d) production of appropriate instructional materials, including laboratory work with specific media; and (e) processes for the organization and maintenance of materials and equipment.

The foregoing statement regarding instructional materials specialists and the preparation they require has important implications for many groups, including the students and teachers who are to be served, the professional associations concerned, and especially for those institutions of higher education which have responsibility for recruitment and professional education of teachers, librarians, and audio-visual specialists. Whatever their titles may be, specialists in the materials of instruction, who have a broad view of the field, are needed to provide essential services for a modern program of education.

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The Yale Report: A Double-Edged Appraisal

by Charles F. Hoban

THE ENTIRE ISSUE of *Audio-Visual COMMUNICATION REVIEW*, Vol. V, No. 3, *released last December, is devoted to a report of two conferences on graphic communication in education held at Yale University in 1953 and 1954. The conferences were sponsored and financed by the Eastman Kodak Company with no strings attached.

If you are interested in solving problems in audio-visual education or improving your knowledge of the field you cannot afford to be without a copy of this report. You will find it so well written, comprehensive, insightful, and stimulating that you will want to re-read parts or all of it again and again. The price of a single copy is $1.25, a real bargain.

Conference members came from the elite of several fields bearing on graphic communication, or, as we generally prefer, audio-visual communication: Professors John Dollard, Mark A. May, and Neal E. Miller, all of Yale University and psychologists of great stature; John Flory, Waldo B. Potter, and Adrian L. TerLouw, of the Eastman Kodak Company, with impressive backgrounds in production, research, and advertising; Professor James J. Gibson, Cornell University, well known as an authority on perception; Professor C. R. Carpenter, Pennsylvania State University, whose research program in instructional films has been internationally acclaimed; Dr. William H. Allen of RAND Corporation and editor of *AVCR;* Professor Edgar Dale of Ohio State University, long an outstanding leader and authority in the audio-visual field; Dr. Arthur A. Lumsdaine of the Air Force whose researches in instructional films have been of great influence and significance; James W. Young of the J. Walter Thompson Company, former University professor and leader in advertising and economic development; and Professor Vincent Nowlis of the University of Rochester, widely known for his studies in motivation, psychochemicals, etc.

The senior author of the report is Dr. Miller. The other conference participants were his collaborators. Miller has great practical insight into problems of education and an ability to communicate. This is a happy combination brought to bear on the report.

The report is organized into two parts with a total of 16 brief and pithy chapters. Part I covers barriers to optimum use of graphic materials and suggestions for overcoming them. To experienced people in the field, most of this part strikes a familiar ring. But there are three important contributions. The problems are organized and formulated more comprehensively than usual and the suggestions for overcoming barriers are many and excellent. To mention just a few: varied approaches to the power and control centers in the educational system; leadership conferences; fellowship programs; a Ph.D. program in educational problem solving; and visiting teams of experts to centers of AV activity throughout the country.

The third contribution of Part I is the cloak of respectability thrown around research into the various knotty and often pedestrian operational problems of audio-visual education. For the most part, these problems involve observation, data gathering, and analysis. Such activities are characteristic of research frequently involved in the Ed.D. program. The point here is that so many problems are either specifically identified or suggested in the report that the survey and clinical approaches of Ed.D. research can now be focused along productive lines.

On the whole, Part I of this report is for the user and promoter of audio-visual education. There is much useful material for the producer and researcher, but the emphasis seems to be on program development and improved use of graphic materials.

Part II is, on the other hand, probably most suggestive for those whose major responsibility is the production of instructional materials. This, of course, is not exclusively so. You could almost make as strong a case for the value of this part to the user, but I found myself thinking mainly in terms of production of more effective graphic materials as I read through this fascinating treatment of theory, research, and application.

In his foreword Dr. Allen writes that the second part — "Scientific Principles for Maximum Learning from Motion Pictures"—is a more "organized statement of a point of view" and represents in particular the psychological orientation of the senior author, Professor Miller. "In my opinion," he continues, "this section of the book is a significant contribution to the field of audio-visual communication and represents the first formal attempt to integrate the findings from audio-visual communication research into the organization of a theory of learning. In so doing, this section raises many fruitful problems for future research." With Dr. Allen's opinion I am in complete agreement.

Miller reduces his theory of learning to four components: *drive* (motivation)—the student must want something; *cue* (stimulus) — he must notice something; *response* (partici-

Director of the Human Factors Study Center at the University of Pennsylvania, Dr. Hoban is a long-time writer in the AV field whose pungent utterances seldom fail to carry weight.

*Subtitled *Graphic Communication and the Crisis in Education.* $1.25 ($2 clothbound). Order from DAVI, 1201 Sixteenth Street, N. W., Washington, D. C.

Neal Miller, senior author, with Kitty Welch, new AVCR managing editor, and Ann Hyer, executive secretary of DAVI.

pation) he must do something; *reward* (reinforcement)—he must get something he wants.

This formulation is not new for Miller. What is important is the skilled and insightful illustrations of each of these components; the references to a wide range of research findings that bear on the components, clarify them, or relate them to audio-visual education; and the use of the language of the layman, rather than the professional patois of the psychologist. Some readers may run into slight difficulty in dealing with "learned drives" and unspecified "rewards" and "punishments," but I doubt that this will be serious. I have never seen a better statement for a general audience without sacrifice of scientific rigor and without that obnoxious little trick known as "talking down" to the reader.

ONE OF THE MOST STIMULATING characteristics of Part II is that Miller over and over again emphasizes what we don't know, what research we must do, and some of the ways we can proceed. But don't get the idea that this is exclusively for researchers. It is not. It is for producers of graphic materials, users, and psychological and AV researchers.

On the subject of producers, I wish the conferences the best of results. I have had an unbroken record of failure over many years in my attempts to bring the results of research on communication to the attention of producers of instructional films, particularly to producers of films for military training. In this career of failure I have found myself in distinguished company. Many of us have parted company with the military film-makers with mutual satisfaction. Yet, this is not the answer for either civilian or military training. We simply must find better ways of working with producers, as is so forcefully suggested in Part I of the report. Ditto for working with the hierarchy of power and control in organized education.

Now to appraise the report. So far I have stressed its contributions. Compared with anything else in the field to date, it is superior. It is excellently written, beautifully designed, and substantial in its contributions. I think Dr. Allen deserves great credit for publishing the report as an issue of *AVCR*, and that the DAVI staff deserves great credit for bringing to bear in its publication the editorial and design talent of the National Education Association.

Now I would like to extend my criticism so that future conferences of this kind may move forward as dramatically as did the two at Yale.

Sometime soon it is necessary that we seriously question any assumption we may be inclined to make on either human or operational perfectability. Improvements can be made and are being made. But it will be a long time before we approach perfection, either as individuals or as units of the social structure. We had better get accustomed to the idea that many problems in audio-visual education must be lived with and that life with AV now and in the future is going to be difficult.

As a matter of professional posture, I don't quite see how we can keep stressing the *profession* of teaching out of one side of our collective mouth, and sighing for the *easy life* for the teacher out of the other. The professions I am familiar with involve difficulties and inconveniences, much planning in advance, and considerable physical activity and movement in space. So does teaching.

ANOTHER IDEA we should examine is that many of the problems in audio-visual education are unique only in application. This idea undergirds Part II of this report, but it is not as discernible in Part I. For example, the problem of cataloging materials of instruction and making them more available to users is only a specific instance of the major problem of information storage and retrieval that is plaguing the intellectual world today.

Furthermore, there is a self-defeating element of professional snobbery in high-level conferences, whether they be in education, military training, communications research, or what have you. It isn't good enough to pay lip service to the many brilliant men and women who have successfully and tirelessly grubbed to establish graphic communication at its present rather high level in education in this country. A greater representation from the working element in the field at conferences dealing with policy and its implementation is, to my mind, a must.

I don't question the competence or insight of a single person at the Yale conferences. I do seriously question the adequacy of the group as a whole to deal realistically with the field and its problems. There just wasn't enough operational experience in the group.

Finally, I would like to suggest that, in conferences on audio-visual communication from here on out, we make a serious effort to bring to the field an overall conceptual structure into which we can successfully integrate what are otherwise disparate elements.

Communication theory is one such conceptual structure. I know only too well how this theory has been abused to the point of absurdity by some articulate members of the communications fraternity. But, to my mind, we can adapt communication theory, in its most simple structure of processes, to our purposes in audio-visual education, and, probably, to much of education in general. The fact is that we do not have a language adequate to the necessary rigorous formalization of education as a process.

In making these suggestions, I am dealing with something of an ideal, and with patterns for the future, not patterns to be superimposed *ex post facto* on highly stimulating and worthwhile conferences in New England in 1953 and 1954. This report of these conferences is the best thing of its kind published to date. It must be judged on that basis. All of us interested in education in general and audio-visual education in specific are deeply indebted to those responsible for the Yale conferences and to those who wrote and published the report.

materials & equipment

SPONSORED FILMS . . .

The Corporal Story (16 min, 16mm, color) is the story of the Corporal, a surface-to-surface guided missile. Shows its design, construction, and test-firing.

Lifelines U.S.A. (26 min, 16mm, color) is a story of the U. S. merchant ships sponsored by the Committee of American Steamship Lines. In newsreel style the film moves with ships from port to port showing the international lifelines that bring together peoples and resources of the world.

Mainline, U.S.A. (20 min, 16mm, color) is sponsored by the Association of American Railroads. A new film on railroading, it takes the viewer into freight yards, aboard Diesel cabs, on luxury streamliners, and into dispatching centers.

Freedom Highway (40 min, 16mm, color). A winner of the Freedoms Foundation award, the film recreates great moments in American history as a group of travelers ride down the freedom highway where Lincoln, Patrick Henry and others built American freedoms.

Any of the above are available on free loan basis from ASSOCIATION FILMS at these addresses: Broad at Elm, Ridgefield, N. J.; 561 Hillgrove Ave., LaGrange, Ill.; 1108 Jackson St., Dallas, Texas; and 799 Stevenson St., San Francisco, Calif.

Other Films of Merit

Gossip, a Sid Davis production distributed by Coast Visual Education Co., 5620 Hollywood Blvd., Los Angeles 28. B&W, 400 feet. This social problem film, designed for the teenager, dramatizes the damage that can result from malicious gossip. Good portrayal of character will get message across to students.

Appointment With Youth, 1100 feet, produced by Crowley Films and distributed by McGraw-Hill Textfilms, 330 W. 42nd St., New York 18. Teacher-training instructions, future teacher clubs, and others concerned with teacher shortage will appreciate the task this film attempts to accomplish. It lends dignity to the teaching profession and places emphasis on the teacher's role in helping students find solutions to their perplexing problems. Fine characterization of a young teacher (male) offsets the often drab classrooms in which the action takes place. Makes for better understanding on the part of parents.

Glass and You, 1200-foot colored film produced by Paul Hance for Corning Glass and distributed by Association Films, 799 Stevenson, San Francisco 3. Can be used effectively from grade five through adult groups. Fine color photography traces the history of glassmaking and stresses modern uses, machines, and techniques. Attention is given to the production of photo-sensitive and heat-resistant glass and some of the unusual uses science makes of it. An excellent film by which the glass industry may be introduced or reviewed.

Young children will want to see and hear the delightful stories that have been recreated on film by Weston Wood Studios, Weston, Conn. Among the best of these 400-foot colored primary story films are: *Stone Soup, Make Way for Ducklings,* and *Hercules.* Children who have seen the films are entranced with their simple charm. Teachers who find storytelling a chore will welcome this assist and will profit from a well-illustrated demonstration in the art of telling stories.

YOUNG AMERICA FILMS section of McGraw-Hill Text Films, 330 W. 42nd St., New York 36:

None for the Road (1½ reels, 16mm, b-w, $75). Shows a teen-age group discussing the problem of teen-age drinking and driving. (Two earlier films also produced in collaboration with the Yale Center for Alcohol Studies are *What About Alcoholism* and *What About Drinking.* Both $50.)

Let's Try Choral Reading (1 reel, 16mm, b-w, $50). For middle grades through high school. Demonstrates choral reading and its simple techniques.

Things Dissolve (1 reel, 16mm, b-w, $50) for primary and middle grades. An elementary science film.

Transportation by Land (1 reel, 16mm, b-w, $50) and *Transportation by Water* (1¼ reel, 16mm, b-w, $62.50) are designed for discussion of the social and economic value of these means of transportation. Suitable for social studies, middle grades through high school.

Recent additions to You Are There titles (all 27 min, 16mm, $125 for 15-year lease): *Attempt to Assassinate Theodore Roosevelt; Bank Holiday Crisis of 1933; Decatur's Raid at Tripoli; End of the Dalton Gang; Fall of Fort Sumter; First Moscow Purge Trials; Great Diamond Fraud; Hitler Invades Poland; Mr. Christian Seizes the Bounty; Overthrow of the Tweed Ring; Salem Witch Trials; Scuttling of the Graf Spee;* and *Webster's Sacrifice to Save the Union.*

Films from Ohio State

The Ohio State University has announced the following 16mm films available from their department of photography. (For further information write Marian Kienholz, Film Librarian, Room 4, Brown Hall, Department of Photography, Ohio State University, Columbus 10.)

Story of a Dam, 17 min, color, sound, $140. Pictures construction of the Hoover Dam Reservoir at Columbus.

Continental Glaciers, 13 min, color, sound, $130. For high-school geography classes and geology at beginning college level.

Legislative Reporter, 20 min, b-w,

sound, $60. Documents the field of legislative reporting.

Engineering for Eddie, 20 min, color, sound, $140. Explores importance of engineering in terms of future generations.

NEW IN PUBLICATIONS . . .

Planning Your Exhibit by Janet Lane and Beatrice K. Tolleris. A 32-page booklet published by the National Publicity Council for Health and Welfare Services, Inc., 257 4th Ave., New York 10. Emphasis is given to window displays, booths, and similar situations that require eye-catching ideas and devices. Among concepts stressed are action, color, design, and the combining of media and audience participation. Many of the basic ideas can be transferred to classroom or school exhibits. $1.25.

A Visit to Germany is a small profusely illustrated booklet issued by the Press and Information Office, German Embassy, Washington 9, D. C. A concise text and well-selected photographs provide an excellent insight into modern and picturesque Germany. The emphasis given to people at work and play, especially the youth of Germany, will appeal to elementary children. International understanding is the principal theme. (Free on request.)

Social study and geography teachers who are not familiar with *Geographic School Bulletins* may be missing rich and vital materials that are appropriate for school use. These bulletins cover an amazing array of topics extending from distant lands of the Far East, Africa, and South America to the commonplace factories, cities, and industries of our own nation. Science articles point out the problems of maintaining balance in nature, study the growth of plants and animals, and follow man in his search for scientific fact on the earth's surface and in the atmosphere. A 30-issue subscription may be had for $1.25 (Canada, $1.50) from School Service Division, National Geographic Society, Washington 6, D. C.

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summer school

BECAUSE of the response from colleges and universities, and because of the interest shown by readers last year, AVI again offers information on summer-school courses and workshops. Listings arriving in the DAVI office after February 15 will appear in the May issue.

CALIFORNIA

University of California (Los Angeles) — **June 23-August 15**

Audio-Visual Education (Four Sections)	McClusky and Webster
Audio-Visual Education (Vocational Education, Special Section)	Dobson
Audio-Visual Education (Early Childhood Education, Special Section)	Webster
Audio-Visual Education (Advanced Course)	Webster
Audio-Visual Education (Seminar)	McClusky

COLORADO

University of Colorado (Boulder) — **June 16-July 4**

June 16-July 18

Audio-Visual Techniques (Intensive Courses)	Margaret Divizia

July 21-August 22

Audio-Visual Methods and Techniques	Charles Schuller
Laboratory in Audio-Visual Materials	Charles Schuller
Administration of Audio-Visual Programs	Robert deKieffer

July 21-August 8

Audio-Visual Workshop	Robert deKieffer

University of Denver — **June 16-August 15**

Audio-Visual Materials, Equipment and Techniques (5 quarter hours)	Harry Kauffman
Motion Picture, Radio, and Television in Education (5 quarter hours)	Harry Kauffman

Dates to be arranged

Practicum in Educational Radio and Television (1 to 5 quarter hours)	Harry Kauffman
Independent Study in Audio-Visual Education (1 to 5 quarter hours)	Harry Kauffman

CONNECTICUT

University of Connecticut (Storrs) — **June 30-August 9**

Audio-Visual Materials in Education	C. W. H. Erickson
Administration of Audio-Visual Services	C. W. H. Erickson

FLORIDA

Florida A & M University (Tallahassee) — **Beginning June 16**

Audio-Visual: Utilization	T. B. Cooper
Production: Inexpensive Audio-Visual Materials	T. B. Cooper

June 16-July 3

Workshop: Instructional Television	T. B. Cooper

Florida State University (Tallahassee) — **July 24-August 9**

Seminar in Educational Television	Director to be announced

University of Florida — **June 17-August 7**

Audio-Visual Materials of Instruction (Class meets daily)	D. V. Legate
Audio-Visual Education (Daily)	D. Winsor
Production and Utilization of Audio-Visual Materials (Daily)	D. Winsor

June 17-July 4

Teaching Through Television (COM 518) (Survey of ETV in U. S.; program classifications and formats; preparation and use of visuals; problems of sets, props, camera usage and people on camera; preparation of scripts; closed-circuit production. 3 hours credit, meets daily 8:30 a.m. to 3:30 p.m.)	L. Franks and Staff

GEORGIA

University of Georgia (Athens) — **June 17-July 25**

Selecting and Utilizing Audio-Visual Materials	G. E. Oliver
Administering the Audio-Visual Program	G. E. Oliver

July 28-August 21

Selecting and Utilizing Audio-Visual Materials	G. E. Oliver
Workshop—Closed Circuit TV for Classroom Observation	G. E. Oliver

ILLINOIS

Illinois State Normal University — **July 16-August 8**

Audio-Visual Education	Clarence H. Kurth
Audio-Visual Program of the School	Murray L. Miller

July 21-July 25

Audio-Visual Clinic	Murray L. Miller

Northwestern University — **June 23-August 1**

Audio-Visual Teaching Materials in the Classroom	Charles R. Crakes

INDIANA

Indiana State Teachers College — **June 17-July 18**

Preparation and Production of Audio-Visual Materials (4 quarter hours—may be taken for graduate credit)	Howard Gillaspie
Administration of Audio-Visual Education (4 quarter hours—may be taken for graduate credit)	Russell McDougal
Audio-Visual Education (4 quarter hours—undergraduate)	V. L. Tatlock

July 22-August 22

The Motion Picture in the Classroom (4 quarter hours—may be taken for graduate credit)	Russell McDougal

July 22-August 2

Workshop in Audio-Visual Education (4 quarter hours—may be taken for graduate credit)	

Indiana University (Bloomington) — **May 27-June 11**

INTERSESSION (Graduate)

Utilization of Audio-Visual Materials	Staff
Preparation of Inexpensive Instructional Materials	Staff

	June 13-August 8
SUMMER SESSION (Undergraduate)	
Audio-Visual Education	Evers
	June 13-August 8
SUMMER SESSION (Graduate)	
Production Techniques	Stevens
Survey of Audio-Visual Communications	Fritz
Utilization of Audio-Visual Materials	Moldstad
Curricular Integration of Audio-Visual Materials	Guss
Preparation of Inexpensive Instructional Materials	Frye
Administration of Audio-Visual Materials	Rugg
Administration of a College Center of Audio-Visual Materials	Larson
Research Methods in Audio-Visual Education	Fritz
	June 23-27
WORKSHOP (Graduate)	
Workshop in Audio-Visual Communication	Staff
	August 8-23
POST SUMMER SESSION (Graduate)	
Utilization of Audio-Visual Materials	Staff
Preparation of Inexpensive Instructional Materials	Staff

IOWA

State University of Iowa (Iowa City)	**June 17-August 13**
Audio-Visual Teaching Materials	Kelly
Advanced Audio-Visual Problems	Stroud and
(Administration)	Cochran
Cinematography Techniques	Mercer
Speech in Television	Becker and Harshbarger
Theater Techniques in Television (Directing)	Schaal

KANSAS

Kansas State Teachers College (Emporia)	**June 2-July 12**
Use of Audio-Visual Materials	Alterman
Administration of Audio-Visual Services	Alterman
Audio-Visual Laboratory	Alterman
Research Methods in Audio-Visual	Alterman
	July 14-August 2
Use of Audio-Visual Materials	Alterman
Audio-Visual Laboratory	Alterman
	July 14-August 23
Research Methods in Audio-Visual	Alterman
	August 4-16
Workshop in Audio-Visual Materials	Alterman

KENTUCKY

University of Kentucky (Lexington)	**Beginning June 9**
Visual Teaching	G. Tauffner
Audio-Visual Administration	G. Tauffner

MARYLAND

University of Maryland	**June 23-August 1**
Audio-Visual Education	Maley

MASSACHUSETTS

Boston University	**June 2-July 12**
Laboratory in Audio-Visual Aids in Education	Gaylen B. Kelley
Use of Audio-Visual Aids in Teaching	Gaylen B. Kelley
Television Production Workshop	Milan D. Barnes
Motion Picture Production Workshop	Homer J. Dietmeier
	July 14-August 23
Creation and Utilization of Instructional Television Programs	Murray R. Yaeger
Laboratory in AV Aids in Education (Two Sections)	Kaylor and Kelley
Use of Audio-Visual Aids in Teaching	William Kaylor
University of Massachusetts (Amherst)	**June 23-July 26**
Audio-Visual Resources and their Utilization	Wyman
Preparation of Audio-Visual Materials	Wyman

MICHIGAN

Eastern Michigan College	**June 23-August 1**
Audio-Visual Methods in Teaching (Two Sections—two hours undergraduate credit)	Oltmanns
Visual Sensory Aids in Education	Peterson
Problems in Audio-Visual Programs	Peterson
	August 4-22
POST-SESSION: FIELD CENTERS	
Workshop at Lincoln School, Pontiac (Audio-Visual Methods in Teaching, 3 hours credit)	Oltmanns
Workshop at Jefferson Consolidated, Monroe (Same as above)	Peterson
Michigan State University (East Lansing)	**June 17-July 25**
Audio-Visual Materials in Instruction (3 credits, graduate or undergraduate)	Page
Audio-Visual Instruction (3 credits, graduate or undergraduate, 4 sections)	Page, Hartsell, Twyford and Schuller (adult education)
Graphic Presentation in Audio-Visual Education (3 term credits, graduate or undergraduate)	Veenendaal
Photography in Audio-Visual Education (3 term credits, graduate or undergraduate)	Page
Audio-Visual Applications in Community, Government, and Industry (3 term credits, graduate or undergraduate)	Schuller
The Administration of Audio-Visual Programs (3 credits, graduate)	Hartsell
Graduate Problems in Education (2-6 term credits)	Schuller
Western Michigan University School of Graduate Studies (Kalamazoo)	**June 23-August 1**
Audio-Visual Education (repeated August 4-15)	Carl Snow
Production of Instructional Materials	Carl Snow
Teachers Workshop in Radio	Wallace Garneau

NEBRASKA

University of Omaha	**June 9-July 12**
Audio-Visual Materials in Education	Moline
	July 14-August 2
Audio-Visual Production Workshop	Greer and Moline

NEW YORK CITY

Teachers College, Columbia University	**July 7-August 15**
Audio-Visual Materials and Methods of Use (2 or 3 points)	Paul W. F. Witt
Laboratory Course in Audio-Visual Instruction (1 to 3 points)	Instructor to be announced
Using Television, Radio, Recordings in Education (2 or 3 points)	Instructor to be announced
Preparation and Production of Educational Television Programs (3 points)	Instructor to be announced
Administering the Use of Instructional Materials (3 points)	M. R. Brunstetter
Communication and the Communication Arts in the Modern Community (2 or 3 points) (Communication s261 PR)	Louis Forsdale and Staff
Science Films and Related Visual Aids (1 or 2 points) (Science 169 FX)	Burnett Cross

New York University — **July 1-August 8**

Audio-Visual Aids in Business Education	
Instructional Material for the Modern Classroom (6 points)	Irene Cypher
Television and Education (6 points)	Charles Siepmann
Mass Communications in American Life (6 points)	George Gordon
	June 3-13
	July 21-August 8
Visual Aids for Group Guidance	Mullin

NEW YORK STATE

State University Teachers College at Albany — **June 30-August 9**

Theory and Practice in the Use of Audio-Visual Materials of Instruction	Floyd E. Henrickson
Laboratory Study of Audio-Visual Equipment and Materials for Instruction	Floyd E. Henrickson

State University Teachers College at Buffalo — **June 30-August 8**

Workshop in Audio-Visual Education (graduate only)	Herman Trubov
Workshop in Audio-Visual Education (undergraduate)	Norman Truesdale

State University Teachers College at Cortland — **June 30-August 8**

Audio-Visual Education	John Shafer
	August 11-22
Audio-Visual Education	Franklin Coolidge

Syracuse University — **June 30-August 8**

Methods and Materials of Audio-Visual Instruction	Charles E. Luminati
Selection and Evaluation of Educational Films	Carson H. Graves
Production of Teacher-Made Instructional Materials	Richard D. Hubbard
Filmstrip and Slide Set Production	Donald M. MacIsaac
Administration and Supervision of Audio-Visual Instruction	Charles E. Luminati
Motion Picture Production: Advanced Techniques	Donald M. MacIsaac
	July 21-August 1
Audio-Visual Communication for Religious Education	Donald P. Ely Rev. George B. Ammon and Consultant Staff
	August 11-22
Educational Television	Eugene S. Foster and Staff
Audio-Visual Materials in Libraries (Lib. Sc. 262)	Carl H. Melinat and Consultant Staff

NORTH CAROLINA

Appalachian State Teachers College (Boone) — **June 10-July 18**

Audio-Visual Aids in Education	John Pritchett
Utilization and Preparation of AV Aids	John Pritchett
	July 21-August 22
Utilization and Preparation of AV Aids	John Pritchett
Administration of Audio-Visual Materials	John Pritchett
	July 7-18
Audio-Visual Workshop	John Pritchett and Staff

NORTH DAKOTA

University of North Dakota (Grand Forks) — **June 16-August 9**

Audio-Visual Material and Equipment	Irving S. Spigle
Preparation of Audio-Visual Materials	Irving S. Spigle

OHIO

Kent State University (Kent) — **June 16-July 19**

Organization and Administration of AV Programs	Wenger
Techniques in Broadcasting (Speech 464)	Clark
	July 21-August 23
Graphic Arts, Teaching Aids, Public Relations (Industrial Arts 590)	Bentley
Use of AV Aids in Instruction (Ed. 337)	Hall
Use of AV Aids in Instruction (Ed. 570N)	Hall

Ohio State University — **First Term**

Audio-Visual Materials of Instruction	Williams
Audio-Visual Materials of Instruction—Individual Studies	Dale, Woelfel, Williams

OKLAHOMA

Oklahoma State University (Stillwater) — **June 2-August 2**

Audio-Visual Education Workshop	L. M. Hohstadt
Administration and Supervision of Audio-Visual Materials	J. C. Fitzgerald

University of Oklahoma (Norman) — **June 13-August 6**

Audio-Visual Materials and Methods	W. R. Fulton
Problems in Utilizing AV Materials	W. R. Fulton

PENNSYLVANIA

Pennsylvania State University (University Park) — **June 9-27**

Visual and Other Sensory Aids for Teachers	Bathurst
	June 30-August 8
Visual and Other Sensory Aids for Teachers	Bathurst
Administration of an Audio-Visual Program	E. Oxhandler
Motion Picture Scripting and Shooting	E. Oxhandler
	August 11-29
Visual and Other Sensory Aids for Teachers	E. Oxhandler

University of Pennsylvania (Philadelphia) — **July 30-August 8**

Graduate Division, School of Education

Visual and Sensory Techniques	Richard S. Heisler

University of Pittsburgh — **July 24-August 15**

Audio-Visual Aids to Instruction	Ivan G. Hosack
Introduction to Radio and Television (Speech S27)	John H. Ulrich

SOUTH CAROLINA

Winthrop College (Conway) — **July 21-August 1**

Audio-Visual Methods (intensive course, 3 semester hours credit, graduate and undergraduate)	Kenneth M. McIntyre
Organization and Administration of the Audio-Visual Program (same as above)	Keneth M. McIntyre

SOUTH DAKOTA

Sioux Falls College — **June 2-July 3**

Materials and Methods in Audio-Visual Education	Leonard Y. Tripp

TENNESSEE

George Peabody College for Teachers (Nashville) — **June 9-August 15**

Audio-Visual Aids in Education	John J. Hanson
Problems in Audio-Visual Education	John J. Hanson

June 23-July 25	
Problems in Audio-Visual Education	John J. Hanson
Television Workshop	Dates to be announced

University of Tennessee — June 9-July 12
College of Education, Library Service Department

Audio-Visual Aids to Teaching	Staff

TEXAS

East Texas State College (Commerce) — June 2-July 12

Audio-Visual Aids to Instruction	Beatrice Murphy
Audio-Visual Methods in Teaching	Quincy L. Atha
Audio-Visual Methods in Teaching	Beatrice Murphy
Audio-Visual Methods in Teaching	Robert L. Titus
Preparation of Audio-Visual Materials	Robert L. Titus
Administration of an Audio-Visual Program	Quincy L. Atha
July 14-August 23	
Audio-Visual Aids to Instruction	Beatrice Murphy
Utilization of Audio-Visual Materials	Beatrice Murphy
Audio-Visual Methods in Teaching	Quincy L. Atha
Audio-Visual Methods in Teaching	Robert L. Titus
Preparation of Audio-Visual Materials	Robert L. Titus
Administration of an Audio-Visual Program	Quincy L. Atha

Prairie View A & M College (Prairie View) — June 2-July 13

Utilization of Audio-Visual Materials	Marion Henry
Preparation of Graphic Materials	Marion Henry
July 14-August 22	
Utilization of Audio-Visual Materials	Marion Henry
Laboratory in Audio-Visual Materials	Marion Henry

VIRGINIA

Virginia State College (Petersburg) — June 9-27

Audio-Visual Materials of Instruction	H. A. Johnson
June 16-27	
Audio-Visual Work Conference for College AV Supervisors and Directors	Madden, Johnson, E. T. Tucker
June 30-August 8	
Organization, Supervision and Administration of Audio-Visual Materials (graduate)	S. A. Madden
Teaching Through Radio and Television	H. A. Johnson

WASHINGTON

State College of Washington (Pullman) — June 16-July 25 (2-hour credit); June 16-August 8 (3-hour credit)

Audio-Visual Aids in Education	Herbert Hite
Preparation and Production of Audio-Visual Aids	W. G. Gnaedinger
June 16-August 8	
Special Problems (1 to 4 semester hours credit)	Hite, Gnaedinger

University of Washington (Seattle) — June 23-August 22

Television Workshop Laboratory (Radio-Television Division)	Director to be announced
Laboratory Work on KUOW (Radio-Television)	Instructor to be announced
June 23-July 23	
Radio Production (Radio-Television)	Instructor to be announced
Radio and Television in the School (Radio-Television)	Instructor to be announced
Television Production (Radio-Television)	Instructor to be announced
Radio-TV Speech (Division of Radio-TV Speech)	Instructor to be announced
July 24-August 22	
Auditory and Visual Aids in Teaching (Education 455b)	Alice H. Hayden
Survey of Radio and Television (Radio-Television)	Instructor to be announced
Advanced Radio-TV Speech (Radio-TV Speech)	Instructor to be announced

Western Washington College of Education (Bellingham) — June 23-July 31

Audio-Visual Methods of Instruction (3 sections; one runs 9 weeks, June 23-August 29)	D. McDonald Ross Glover Richard Hawk
Administration of the AV Program	McDonald
August 4-22	
Workshop on Construction of Instructional Materials	D. McDonald
August 3-22	
Educational Television Workshop (Speech 489)	Paul Herbold

WEST VIRGINIA

West Virginia University — June 4-July 16

Audio-Visual Resources for Instruction (2 hours credit)	Chalmers A. Ault
Organizing Programs of Audio-Visual Instruction (2 hours credit)	Chalmers A. Ault
July 17-August 27	
Audio-Visual Resources for Instruction (2 hours credit)	Virginia Kelly
Production of Audio-Visual Resources (2 hours credit)	Virginia Kelly
June 4-July 16 and July 17-August 27	
Practicum in Audio-Visual Education (1 to 4 hours credit)	H. B. Allen
Problems in Audio-Visual Education (1 to 3 hours credit)	H. B. Allen

WISCONSIN

Stout State College (Menomonie) — June 23-August 1

Audio-Visual Education (graduate and undergraduate)	D. B. Barnard
Production of Audio-Visual Materials (graduate and undergraduate)	D. B. Barnard
Problems in Audio-Visual Education (graduate only)	D. B. Barnard
Elementary Photography (undergraduate only)	R. C. Cornwell
Problems in Graphic Arts (graduate only)	L. Whydotski

University of Wisconsin (Madison) — June 30-August 22

Methods in Audio-Visual Instruction (Two Sections)	Frederick A. White Maurice T. Iverson
Local Production of Audio-Visual Materials	Maurice T. Iverson
Seminar in Audio-Visual Education	White, Iverson, Walter A. Wittich
Introduction to Television Broadcasting	Jerry C. McNeely
Television Production and Direction	Jerry C. McNeely
Writing for Television	Jerry C. McNeely
Seminar in Radio and Television	Ordean G. Ness
July 28-August 22	
Methods in Audio-Visual Instruction	Walter A. Wittich

WYOMING

University of Wyoming (Laramie) — June 16-July 18

Audio-Visual Instruction	John D. Alford
July 21-August 22	
Audio-Visual Workshop	John D. Alford

editorial | *Anna L. Hyer*

did you ever see a dream working?

I'M TOLD that knowledge is advanced by those who know how to ask the right questions, but it still remains a pleasant pastime to dream about the right answers!

For a group bent on selling the use of new tools for the improvement of education, we audio-visualists have shown little concern over using technological advances to solve our own professional problems. Finn in an article in *Audio-Visual COMMUNICATION REVIEW* in 1955 said:

> . . . Figuring two hours per book, it would take one person, reading 24 hours a day, approximately two years to read the 15,000 volumes received in the sciences and technology by the Library of Congress during a three-month period . . . The skyrocket growth of the record of knowledge is not, however, confined to books . . . If the existing collection of audio-visual materials is to serve us—if we are to get the right material to the right place at the right time, as so many of us try to do—we must begin now to do something about classification, cataloging, and location.

As one views the rapidly increasing size of Wilson's film and filmstrip catalogs and attempts to use them, it is readily apparent that our present system of recording and retrieving film information is not too satisfactory and can be expected to become increasingly worse. To complicate matters, what we need is not film, filmstrip, and recording guides but *one* source that integrates all types of audio-visual materials and even one that integrates printed and audio-visual materials. The longer we wait, the more difficult it will be to put into practice a suitable system or systems.

Jesse Shera, dean of the School of Library Science of Western Reserve University, became concerned over the inaccessibility of recorded information, particularly that in journals and pamphlets needed for scientific purposes. A Center for Documentation and Communication Research was set up in 1955 at Western Reserve and later a Council on Documentation Research was organized.

The NEA is a member of the Council and for the past two years I have been the NEA representative at Council meetings. A year ago when a Symposium on Systems for Information Retrieval was held at Western Reserve, the accompanying exhibit included over 20 demonstrations of systems presently in use for the organization, storage, and retrieval of recorded information. Included were semi-automatic systems, systems using accounting or statistical machines, and ones using computer or computer-like devices.

Some systems are quite simple in operation, for example, those using hand-punched cards and manual sorting methods. In contrast are the electronic "brains" which can hold millions of bits of information in their memories and search through these memories with lightning speed. Some systems will accommodate the printing of brief abstracts on data cards. After a search is completed and the data cards for documents answering the specifications have been dropped out, it is possible to automatically type or photographically reproduce the abstracts.

In February the Council on Documentation Research called a special meeting to discuss the growing pressure for the creation of a national center for processing science information. Among the 200 participants representing professional organizations, industry, government, and foundations were several industrial researchers who claimed that it is frequently cheaper to repeat experiments than to locate information about the original research. Some system that will make possible the fullest utilization of existing knowledge seems to be needed desperately and is in fact now under consideration.

The Soviet Union has already taken steps to solve this problem. In 1952 the USSR established the All-Union Institute of Scientific and Technical Information. This Institute has a full-time staff of over 2300 and publishes about 400,000 abstracts a year, including translations from more than 800 foreign journals. Of the 200 Russian journals of major importance to American scientists, only 30 are being translated under U. S. government sponsorship.

No mention of educational needs as such was made at the February meeting of the Council or in any of the writing I have seen to date, but one can dream of a national center coding information in education and related fields, preparing abstracts for distribution, and conducting machine searches for answers to specific questions. Education might be able to cut by 10 years the lag between research and practice! In all likelihood new

relationships between areas of knowledge would appear, research would improve and even new research patterns and problems emerge.

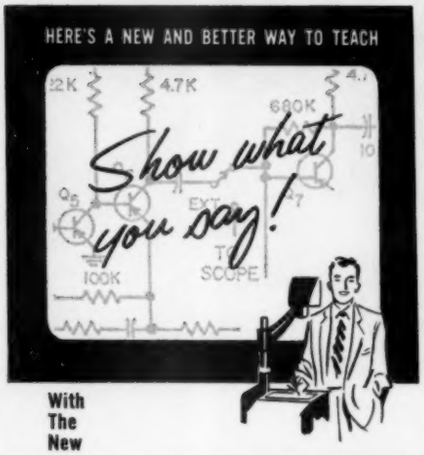
Easy accessibility of audio-visual materials for individual and research use has always been a problem. Perhaps a creative application of television such as the recent innovation in the library field would be a partial answer. With the aid of a grant the University of Virginia has set up a closed-circuit experiment whereby the student can go to any branch library, telephone his request to the main library, and without leaving the premises can read the book of his choice over television—even to turning the pages.

Film Catalog as Starter

A beginning in the use of a semi-automatic film information retrieval system has been made by the Institute of Aeronautical Sciences. A Technical Film Catalog employing a Uniterm system with over 2800 descriptive subject headings has been developed. Between 1950 and 1956 over 2300 films were cataloged. In the Uniterm system a separate data card is maintained for each subject heading. On a subject card each of the films containing information about that subject is recorded in code. (The Technical Film Catalog is designed to supply a bibliography or do subject search on technical data recorded on motion pictures.)

Suppose that a national Audio-Visual Institute could obtain sufficient agreement on the information needed about any audio-visual material, a suitable encoding system, and a machine method for searching; suppose that money could be found to get the project underway. Think what time and money could be saved in the preparation of bibliographies and catalogs, and how much film utilization might be increased. One can envision a national service perhaps supplying coded cards to duplicate regional libraries and even to specialized searching services such as those in psychology or medicine. Under this plan each service center would have the same type of searching equipment.

Today I'd be willing to settle for just a semi-automatic method of motion picture searching. I have a lengthy bibliography to prepare!



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Gifted Child—continued

perience and enriched information. They are of two types: the trip for an entire class of the ablest students and the one for special interest groups. For example, pupils representing various grade levels who are interested in electronic devices will benefit from a trip to look into the electronics of radio, television, or computer equipment.

There is a definite place for audio-visual communication in the pre-service and in-service training of teachers of talented pupils and in orienting parents of these pupils to their special problems and responsibilities. The effectiveness of audio-visual techniques has been proved in past campaigns to get public support for educational programs, and there is no reason to believe that they can-

ANOTHER SUMMER SCHOOL "MUST"

Largely due to urging from various DAVI members, the April 1956 issue of the REVIEW OF EDUCATIONAL RESEARCH has been reprinted. A review of the research in instructional materials over the previous ten-year period, it covers these topics; printed materials, audio-visual materials, community resources, free and inexpensive materials, and resource centers. William H. Allen, editor of AVCR, prepared the 32-page section on audio-visual materials. This book will be an invaluable reference for your students. Price, $1.50.

not be likewise employed in a program for teaching bright pupils.

Thus in every aspect of educating the academically talented — instruction, teacher training, parent orientation, and public relations—audio-visual materials and techniques have a significant part to play. The power of the audio-visual aid can be used to spark the minds of the gifted. It can bring out a high level of performance, encourage persistent curiosity, and develop the habit of "questing" which is a persistent seeking for new ideas and information. It can help correct the current situation of "guided missiles and unguided children."

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8th and Eye Streets

San Francisco
Photo and Sound Company
116 Natoma Street

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Ft. Lauderdale
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Wayne Camera and Visual Equipment Company
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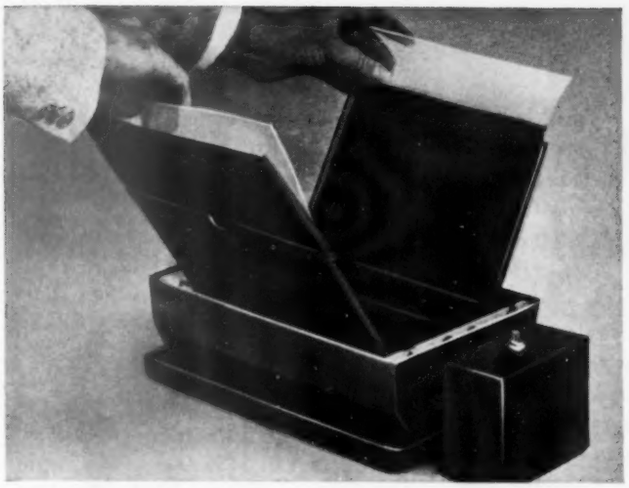
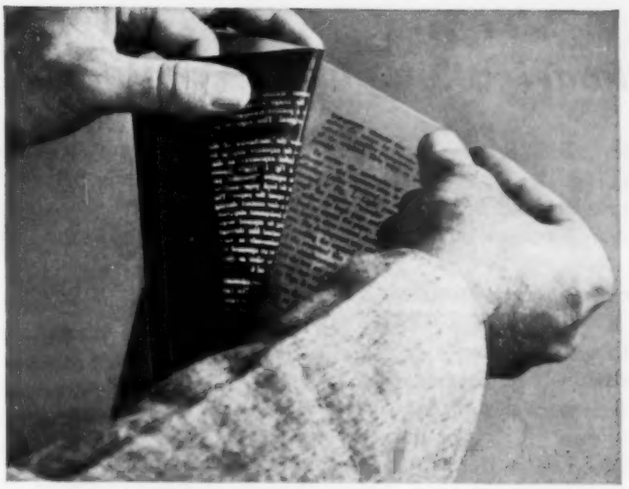


DEVELOP. Process exposed negative and positive film together.



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Imagination plus X—continued

ter understanding of what they are doing right now. We are trying to present math as a body of ideas rather than a collection of skills."

THE MOST PERVADING mathematical idea that the Illinois experiment tries to propagate is the concept of sets. Sets in themselves are old, but their presentation as a point of view is new. A set is any collection of things. The things can be numbers, points, lines, vectors, physical forces, people, or a set can be a philosophical notion such as brotherhood. By thinking in terms of sets, children learn to see apparent relationships, discover hidden patterns, and invent new arrangements to meet new problems. Having evolved this habit of thinking, they forget the details and retain a mental discipline which can be useful in such advanced modern mathematical techniques as public opinion sampling, statistical testing of the validity of drugs, programming of high speed computers, or calculating the orbit of a man-made moon from the position of "beeps" in the sky.

The concept of sets is brought into the new math course at the ninth grade level (it could be done earlier, Beberman says, perhaps as early as kindergarten, with sets of toys) and carried throughout the four high school years. Solutions and graphs (or "pictures") of inequations (as well as equations) are touched on in all the courses. There is heavy emphasis on analytic geometry (usually studied in the freshman college year) from the ninth grade up. In tenth grade, pupils are presented with numerous models of postulate systems (usually not taught until the graduate level of college). Twelfth graders get heavy emphasis on the circular functions, which are part of modern trigonometry.

What has been dropped to make room for the new materials? First, logarithmic solutions of triangles. They have lost their old value with the growing use of desk computers. The alleged derivations of mensurational formulas for spheres and cones have been cut from solid geometry because better proofs can be given in calculus. Finally, Horner's method for finding irrational roots of polynomial equations has been abandoned in favor of Newton's more widely applicable method for doing the same thing.

Teachers of the Illinois method are almost unanimous in saying that, although it is more fun to teach math this way, it is also much more work. (Some schools have arranged for the experimental teachers to have a little free time for preparation.) "The youngsters' questions can be really tough," one teacher who has been through the mill reports, "and the subject matter is tough, too. Still, I never liked being a drill sergeant, which is about what I felt I was under the old method."

Not only the talented boys and girls who attend the University of Illinois High School in Urbana (an experimental school where the new course was launched in expectation that only unusually bright children would respond) but other pupils in public high schools take to math's abstractions with pleasure. More pupils under the Illinois program go on to the third and fourth year of math than do children who receive conventional math teaching.

This fall the first group who have been exposed to a full four years of the new ideas entered college. Their success in higher mathematics will be a rigorous practical test of the innovation's value. But the return from the original investment made by the University of Illinois and a subsequent grant of $277,000 by Carnegie Corporation of New York is not to be reckoned solely in the production of Newtons and Einsteins.

Genius can use, but hardly needs, the impetus of the University of Illinois Committee on School Mathematics. There is a rich reward in watching the faces and hearing the voices and feeling the animation of more ordinary children to whom a whole new world of imagination is being opened—boys like the redhead in Barrington High School's ninth grade who, in the middle of a lesson on multiplying positive and negative numbers, suddenly cried "I *see*!" with all the fervor of a Balboa discovering the Pacific.

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Instructional Conferences

DAVI was represented at Regional Instructional Conferences conducted by the NEA in Boise, Idaho, February 16-19 and in Portland, Oregon, February 19-22. Allan Perry, supervisor of the AV center at the University of Idaho, and John E. Mattson, director of the film library at Boise Junior College, represented DAVI at Boise; Phyllis J. Nerheim, director of instructional materials for King County (Seattle, Washington) and A. K. Trenholme, director of instructional materials for the Portland public schools, were DAVI representatives at Portland. Among DAVI members who acted as conference leaders were: at Boise, Helen Heffernan, chief of the bureau of elementary education, California Department of Education; at Portland, J. Wesley Crum, dean of instruction, Central Washington College of Education, Ellensburg, and Joseph Hall, director of curriculum, Oregon Department of Education.

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HI FI VIEWTALK

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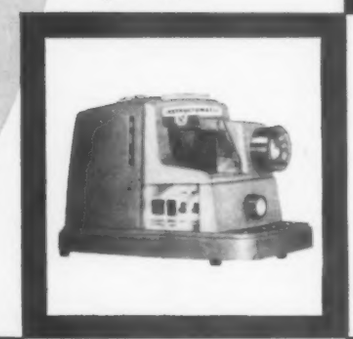

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Completely automatic projection of 2 x 2 and bantam slides. A touch of changer automatically brings new slide in position. Automatic timer—remote control—lets you sit with your audience. 500 watt fan cooled. Interchangeable lenses. Turns room light off when projector is turned on.

V-4S — V-44S

For single-frame filmstrip. The ideal budget-priced filmstrip projector. Clear, sharp projection; brilliant illumination; simple to operate. Cannot tear film. Model V-4S 150-watt convection cooled. Model V-44S 300-watt motor fan cooled. 2", 3", 5" and 7" focal-length lenses available.

V-2C - V-22C - V-25C

For 35mm filmstrip single and double frame, vertical and horizontal pictures, 2x2 and Bantam slides, any type mount. Change from filmstrip to slides in seconds. V2C—150-watt, V-22C—300-watt motor fan cooled. V-25C—500-watt motor fan cooled. 3-5-7-9-11 inch lenses.

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